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may get hold of unsuitable apparatus, and a little thought previous to purchases is advisable. The man, not the camera, makes the pictures, as we have emphasized; but this constitutes no reason why he should not employ the most suitable and convenient ways of making them.

### SIZE

If any one will take the trouble to superficially compare landscape prints by, say, a dozen or two average photographers, he will surely find that their distinguishing characteristic is that their makers have taken a great big slice of the world and made it small. All the heterogeneous components of an unselected landscape which an angle of view of some sixty-five degrees includes,—a road, two or three woods, a few hills, some water, a house, probably a cow or two,—all these, or some similar collection, are herded together within the confines of a 5 x 7 print. Now, combinations of many elements can, of course, be handled pictorially; but the difficulty increases vastly with the number of such elements. How is it that it occurs to so few beginners to tackle something smaller, and make a good big print of it? The big print is a great critic; the larger it is, the more its faults howl; *per contra*, at the same time, the more striking become its merits; it thus has an educational and corrective value of no low order. But it is not with this feature of the big print that we are primarily concerned. The landscape worker, we have said, need not expect to be prolific; his prints should be few, the result of much work and ruthless suppression. Suppression becomes much easier and more natural where a finished print involves an enlarged negative! — which is an advantage; but such pictures as the maker has thought worthy of the labor of “working up” into the finished print of large size he will not want to inter in an

album or portfolio. Their destination will be the walls of his home or of his friends' homes, or of exhibitions. Now, mural display calls for a certain generosity of dimension. It must, of course, be recognized that all work has a "scale" of its own; and what scale will show any particular picture to best advantage can be determined by inserting a positive transparency in an enlarging lantern of the projection type and comparing the effect of different degrees of enlargement on a sheet of paper fixed on the enlarging easel. Some little experience and taste are necessary to hit upon the point at which the increase in effect begins to degenerate into the crudeness which marks over-enlargement; and the beginner will find it very instructive to study the effect of progressive increase of size in this manner.

While, then, the pictorialist is advised to work out the size that seems to him most suitable for the presentation of his own work, it may be safely said that most landscape work can be favorably presented in the sizes 10 x 12 or 11 x 14 (or such parts of these sizes as the shape of the picture permits). Our own preference is for the latter size, which seems to us to combine a maximum of effectiveness (in the case of the greater number of our own subjects) with a minimum of the awkwardness and difficulty of manipulation which attend the use of very large sizes. Whatever size be adopted, it will inevitably be such as to preclude the idea of direct work, and will demand the use of an enlarging outfit as an essential part of the equipment. This should be preferably of the projecting type, with a movable easel, so that any portion of the original desired may be enlarged to any desired size. If a lantern of the usual condenser type be purchased, it is convenient to have it of such a size as will take a plate larger than the one for which it is desired to use it. A pair of six and one-half inch condensers, such as



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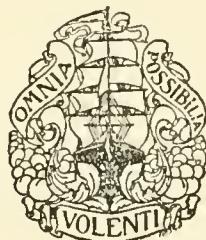
# PICTORIAL LANDSCAPE PHOTOGRAPHY



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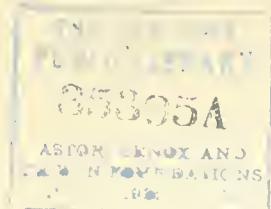
BY THE  
PHOTO PICTORIALISTS OF BUFFALO

*With 53 illustrations by members of the Society*



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## PREFACE



So we look back to the year 1905 in the history of pictorial photography in America, it seems very near the beginning. Independent workers here and there had created sensations with their work. Some salons had been held and the Photo Secession had made its name known both here and in England. On the whole, though, outside of limited circles, very little encouragement could be found in photographic clubs and magazines for those who attempted to put anything in their pictures except what could be obtained by the mechanical use of a lens.

Even before this time, however, a number of photographic workers who were affiliated with the Buffalo Camera Club felt an urge in the direction of self-expression and, while still retaining membership in the club, decided to form a little group devoted to more intensive work. Their feeling was that in this way some of the objectionable features of formal society meetings could be eliminated and their time given rather to the study of picture making than to parliamentary proceedings. This group determined to do without any mechanism in the way of organization, rules, or constitution and their sole business function was an occasional voluntary whip-around for such amounts as were absolutely necessary to defray the slight expenses of the meetings. This method of procedure was adhered to as long as the society existed and the single officer originally appointed, a secretary, acted permanently in this position.

The society was originally composed of eight members, G. Edwin Keller, Edward B. Sides, Charles A. Booz, Oscar C. Anthony, Will A. Hatch, John M. Schreck, S. S. Lloyd and W. H. Porterfield, the secretary, all of whom were residents of Buffalo. Two additional members came in later, F. Austin Lidbury and Augustus J. J. Thibaudeau, of Niagara Falls.

These members met regularly at places chosen by the secretary, who endeavored to select such spots as would furnish suitable subjects for study and comment. One of the many beautiful spots in Delaware Park would frequently be chosen for a meeting and there the Photo-Pictorialists of Buffalo, as the group called itself, would bring their prints and cameras, criticise the work previously done and endeavor to repeat it more successfully or make new negatives of greater value. Other meetings took the form of visits to the Albright Art Gallery but, out of deference to the surroundings, prints were not brought on these occasions, though the lessons to be learned from paintings and other forms of graphic art were always studied with the thought of camera expression in mind. The greater number of the meetings, however, were held in the homes of members, especially in the winter months and on these occasions the program varied between intensive study and demonstrations of various processes, the criticism of prints, and social enjoyment, which helped to make the non-photographic members of the families more tolerant of the time consumed in photographic work.

It was not long before this intensive application to pictorial photography won recognition for the Photo-Pictorialists. The photographic magazines began to publish articles, usually written by some member of the society and always accompanied by illustrations. Their pictures were to be seen on the walls of exhibitions in America and abroad. The quality and individuality of the work attracted much favor-

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able comment and those familiar with the progress of photography soon discovered that the work of this group had a coherence previously unfamiliar in photography, so that the title "The Buffalo School" was invented and frequently applied to their work.

So the years rolled on. The group remained united and productive, and its work was both sought after and familiar throughout the world wherever good photography was shown. Then came the fateful year, 1914, which wrecked so many things familiar to a world forever passed away, and the group of Photo-Pictorialists also dissolved coincidently with the downfall of so many greater things. Other tasks, great or small, have claimed the energies of the Photo-Pictorialists during these years of strife and reconstruction and only Porterfield today remains as a strong figure in photography, but the work of the group accomplished more than the instruction and pleasure of its own members. It gave a definite impulse to photography in America, especially to landscape photography, and our salons of 1921 will show on their walls landscape work on the grand scale which the Photo-Pictorialists first produced in this country, and following the paths which they broke out. Their pictures are scattered, they can never be collected again as originals, but they remain in the minds of men and a few have been brought together for the illustrations of this book. Their theories and methods have not perished and must not be forgotten, so they have here been resurrected from the pages of periodicals in which they first appeared and, revised with mature judgment, are here given permanent form. May they give other pictorialists the same stimulation and pleasure that they gave the men who mutually created them.

FRANK ROY FRAPRIE

BOSTON, 1921.



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## PICTORIAL LANDSCAPE PHOTOGRAPHY



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# PICTORIAL LANDSCAPE PHOTOGRAPHY

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## I

### ITS NATURE AND SCOPE



PICTORIAL landscape photography forms an ideal spare-time occupation. It involves open-air exercise at all periods of the year, and even under weather conditions when the more common outdoor hobbies fail to lure their devotees; it fills up the evening hours and photographically unfavorable days by providing in its technical branches a most interesting variety of work for mind and hand; and it requires a constant training of the aesthetic faculty, furnishing in return an immeasurable reward in the development of the sense of beauty. No other pursuit vies with it in the comprehensiveness with which it includes the exercise of physical, mental, manual and psychical faculties.

Pictorial landscape photography differs from other branches of pictorial photography in several respects; for instance, the material or subject matter is more frequently and more universally available; and it can be practised more deliberately, as a rule, than those branches such as genre, portraiture and marine, which more frequently involve the seizure of the psychological moment. But the greatest difference lies in the fact that the exclusion of extraneous ele-

ments of interest forces the landscapist to rely exclusively upon purely intrinsic beauty and character. The interest which is often felt in the personality of the subject of a portrait, quite apart from the manner in which the artist has treated it, and in the literary and narrative elements which in genre work too often take the place of the purely pictorial element, has little or no counterpart in landscape work. The latter possesses little appeal of the literary variety, and even illustrative qualities tend to become inconsistent with pictorial presentation of a landscape subject; so that it occupies much the same position in relation to pictorial photography in general as what is called "absolute" music does in relation to the art of music. It is, in other words, dependent upon strictly pictorial quality, and is devoid of the assistance which other branches of pictorial work sometimes derive from the bastard elements of aesthetic synthesis referred to above. This, at once, makes its really successful practice the more difficult and justifies the opinion that it is the purest form of pictorial photography.

It would be impossible to define exactly what is above referred to as pictorial quality; but it is perhaps within the mark to say that "character" is a somewhat too inclusive word, and "beauty" (as generally understood) a word of too limited significance, to properly express its meaning. In proportion as a photograph is expressive, possessing character and beauty (the latter word being here used in the wider sense of the artist), it possesses pictorial quality; failing the possession of this quality, however remarkable it may be in other ways, it does not come within the category of pictorial work.

We are not, then, at all concerned with what may be termed the topographical aspect of landscape photography. A literal transcription of natural features, unselected and

unarranged, gives the observer nothing which he cannot see better for himself. Such work has no *raison d'être*, as every amateur discovers in due course. What is not so readily discovered is that the striking impressions received from nature are not automatically recorded by the camera. Those so common photographs that seem to include something like one-third of the entire horizon and all the accompanying panoramic accessories, as well as those equally common "woodland glades," usually with a waterfall sandwiched exactly midway between two heavy black masses of foliage, in fact, all the landscape photographs of the few well-known types that include ninety-nine per cent of the amateur's work in this direction, have their origin, little as an observer might gather it from the prints, in a rudimentary sense of beauty. Some strong, though crude and vague impression impelled the photographer to stop and make his feeble attempt to record it. Forgetful that the lens has not the eye's power of accommodation, nor yet its faculty of concentration, and that the plate has not the mind's automatic power of selecting impressions, he produces merely a geographical document. What is surprising is that he is so often content with the result. The reason doubtless is that the momentary impression which led to the birth of the photograph was unconscious and unrecognized, and completely lost in the subsequent interest of securing a "clean, brilliant negative" and, as a sequel, a "snappy" print. There is, in fact, a lack of recognition of definite motive in making the exposure, and an absolute divorce of the technical operations from any other idea than the production of a result of a certain conventional, mechanical nature.

Such, then, is what pictorial landscape photography is not. To the pictorialist the panoramic, the pretty, and, in general the superficially striking are things to be strictly avoided.

He knows that the hazy impression, which prompts the beginner to expose on such subjects, is a partly subjective effect, to which the machine is no party, and which consequently evades capture; and that, on the other hand, it is the result of the mental exclusion of multitudinous features which the lens is bound to record. To him an exposure is a step in a long synthesis, in which the result — the production of an expressive picture — is always kept in mind. Much has to be learned and perhaps as much forgotten, before this state is reached.

The production of an expressive result implies two things: something to express, and the ability to express it. It must be the constant effort of the photographer to acquire, by severe practice and study of the simple, what may not aptly be termed the pictorial eye. His object must be, first, to see the beautiful, then to reproduce his vision of it for others. To extend his consciousness of beauty to its subtler phases, to analyze his impressions, to strip off extraneous and disturbing factors, involve a course of self-development and aesthetic study to be assiduously and continuously pursued. Not only will every advance in aesthetic vision show itself in the pictorialist's work, but he will be repaid by the pleasure of recognition of hidden beauty and character denied to those who do not search for it. How far he will succeed depends, in the first place, on his natural aesthetic gifts; in the second place, upon the persistence with which he studies nature. The tireless observer is the one to whom beauty is revealed, and it may be pointed out that observation should be practised not only "in the field" but at all times. Mental analysis of impressions, whenever made, will lead to applications in actual work perhaps not anticipated at the time. "Moonlight" pictures are not made by moonlight; and the soft light and mysterious shadows of evening

are depicted through observation at evening, and photography at other hours. This is mentioned to show that the photographer need not be content with what he gets on his plates, unless he wants to. Modification is limited only by his skill and the knowledge of what he wishes to do. As regards material, the world is his oyster. There is no locality which will not yield an abundance of material, and, though it is not wise to pay attention to those advisers who tell you that everyone ought to find photographs in his own back garden, there is a great deal of truth in the statement that the best results are to be obtained from landscape with which the worker is thoroughly familiar. Our own experience is to the effect that a spot is sometimes worked for more than a year before it begins to yield results; but that when it does, the danger is that it is apt to yield so much that monotony of subject has to be carefully guarded against. The beauties of form, of balance, of atmosphere, and of Nature's moods, all afford material for study, with the camera and without it; and unless the photographer has himself felt, observed and noted, he cannot expect his work to carry any conviction, or even to justify the labor expended on it. Little can be learned from others in this respect; but a certain amount of taste and artistic inclination may be assumed in the case of a photographer who desires to cultivate pictorial work, and self-development on the lines above indicated can be aided and guided by a study of works of art whenever possible, and analysis of their expressive qualities. The study of books on composition and on art generally may be of assistance, or the reverse, according as they help the student in the analysis and study of paintings and other art works, or as, on the other hand, they lead him to suppose that pictures can be made by merely observing certain cast-iron rules. In all forms of art the rules of construction are very

elastic and at best only very incomplete and inexact attempts to formulate the indefinable, and they are useful only in so far as they assist the student, by simplifying his understanding of works of art, to develop an instinctive sense of good composition as a matter of feeling rather than of calculation. While, however, the acquisition of the pictorial eye and the development of whatever natural ability he may possess are matters as to which the photographer must depend largely on himself, he may be greatly assisted by association with others possessing similar aims, and his attempts to express himself may, with advantage, be submitted for criticism and advice to persons of known artistic ability. Much can be gained, for instance, from the advice of a friendly and sympathetic artist-painter; only, it should be remembered that not all painters, but only a painfully small percentage, are artists. No attention should be paid, however, to either criticism or advice from technical photographers; their point of view is a different one, and the qualities which they notice are those with which the pictorial photographer, as such, has no concern.

Even assuming something to express, to be able to express it involves, not merely a purely conventional technique, but an intimate acquaintance with the powers of variation of effect of which the photographer's tools are capable. Later chapters will deal in some measure with tools and methods which have been found to lend themselves to the extension of the range of expression in landscape photography; and here we will merely point out that the extent to which a pictorialist will find expression possible depends entirely on the extent to which he is able to cut himself away from the limitations of conventional photography and control his media in the interest of his idea, instead of being a slave to rule and to popular conceptions of photography.

It must, further, be with an eye upon the limitations and possibilities of photography that he must choose what he wishes to express. The limited control over the arrangement of his subjects (consisting solely of the choice of viewpoint) and the fact that the lens records every portion of the subject with but little power of subordination, determine the characteristic of successful landscape work as extreme simplicity. The more complex the scheme and the more diverse its components, the greater (in geometric ratio) become the difficulties of composition and the danger of incoherence. Limitations are to be found, also, in the restricted range of possible tone-values, in the monochromatic nature of the print, and in other respects. The pictorialist has to learn, therefore, to see his visions in a photographic plane of existence. This will be found largely a matter of practice, but even with much experience it is difficult always to recognize when a striking effect is merely a result of a certain color-accent which is not reproducible as accent in monochrome.

The print reproduced on page 19 ("An October Evening") will show in some degree, in comparison with the print from the original  $3\frac{1}{4} \times 4\frac{1}{4}$  negative, the possibilities of a little manipulation, and will illustrate the fact that it is by no means necessary to be content with what is obtained in the negative. The original print is practically devoid of pictorial quality; it is merely, as it stands, a record of a not too attractive subject. Its pictorial possibilities are, however, well shown in the final result, a print from an enlarged  $11 \times 14$  negative. The sun has set, and its illumination on the sky near the horizon is reflected in the quiet water; the tone of the print and the quality of the darkening sky lend a somber element to the effect, which is intensified by the almost, but not quite, leafless branches. The foliage is still sufficiently thick to mass in the softened distance against

the horizon; but in spite of the essentially quiet and restful impression conveyed by the picture, there is an undercurrent of sadness, a hint of the gloomy days to come. The picture will serve, therefore, not merely as an example of what is possible from an unpromising original by utilizing it merely as a foundation for the finished picture, but also as an instance of temperamental work, perhaps as far removed from the usual run of topographical landscape photographs as it would be easy to find. Three points may be referred to in conclusion:

1. It is necessary to dispassionately examine every subject on the screen before exposing it. Ask yourself whether it really contains qualities which justify an exposure. Severe examination of his subjects will teach the beginner not to waste plates. At the same time it is not wise, after this lesson has been learned, to be too critical of the image. A plate saved on a subject which seems almost, but not quite, worth the exposure sometimes means a wasted opportunity. Sometimes such subjects can be turned into successful results by subsequent manipulation; sometimes subsequent study of the result will lead to a modified and successful exposure on some other occasion. Remember:

*The beginner is apt to waste plates; the advanced worker to waste opportunities.*

2. Nothing more goes into the result than the worker puts in. Pictures are not made by accident. This does not mean that the idea of the finished picture must be complete at the time of exposure; it is a growth that has its birth at that time. What it does mean is that a fogged or underdeveloped plate does not yield a picture by the naming of the print "A Gray Day" or "Shades of Eventide." That sort of thing is not pictorialism, but an exhibition of ignorance. Remember:

*There is one thing worse pictorially than a merely good technical photograph; and that is a merely technically bad photograph.*

3. A landscape photographer who has to obtain his living and is consequently limited to holidays and evenings for the practice of photography, and who diligently applies himself thereto, may consider himself fortunate if, at the end of each year, he has produced six photographs which are also pictures. These will, of course, be the survivors of many attempts and failures. But remember:

*One picture of outstanding excellence is worth more than not one dozen, nor one hundred, but an infinite number of mediocre and undistinguished ones.*

## CHAPTER II

### SOME NOTES ON EQUIPMENT



EVERYONE knows the retort of the famous painter to the Philistine, who inquired with what he mixed his paints: "With *brains*, sir!"

Just as truthfully, and possibly even more appositely, may the photographer be reminded that the most important and indispensable item in his photographic equipment is — brains. For few people are so benighted as to imagine that a painter's genius resides in the chemical composition of his pigments, whereas the heresy that good pictorial photography is a matter of this or that lens, camera, plate, developer or printing process is, unfortunately, still as widespread as it is stupid. It has been explained almost *ad nauseam* that some of the finest pictorial work has been accomplished with apparatus at which the modern pampered amateur would simply turn up his nose; but still the exhibition of an unusually fine or original print provokes the inevitable inquiry, "What lens?"

Let us, therefore, clear the ground by reiterating that the important thing is, not that the pictorialist should have a magnificently expensive outfit, but that he should be able to see a picture where another man does not, and know how to reproduce it in the manner he desires with what apparatus he possesses. Having thus emphatically disclaimed any intention of fostering the foolish idea that pictorial photography

is merely a matter of such and such apparatus and methods, it may perhaps be safe to point out, on the other hand, that such truth as may reside in the old adage that "a good workman never quarrels with his tools" lies largely in the fact that the good workman takes care to have tools that are suitable and convenient for the line of work in which he engages. Good pictorial work can be done with almost any equipment; but this does not detract from the force of the observation that some apparatus is vastly more convenient than others, some methods are more suitable than others. The following pages are based on the results of our own experience; but whatever success we have had in the use of the methods to which we shall refer is merely due to the fact that they are adapted to the requirements of our lines of work. It is not suggested that they are the best, or even the proper methods for any one else's work, and we wish not so much to recommend the adoption of any of them as to use them as illustrations of the important principle that in the selection of equipment, *the first thing is to know what you want to do, the next to select the apparatus most suitable and convenient for doing just those things, and not something else.* The pitiful but, alas, common spectacle is familiar to most photographers, — the amateur who has put out his money for the purchase of an instrument, the use of which he neither understands nor takes the trouble to learn to understand, and which would be of no particular use to him if he did understand the use of it. Everyone has met, we presume, the proud amateur who displays his magnificent and speedy anastigmat ( $f: 4.5$ ) and naïvely explains that he never uses a larger aperture than  $f: 16$ , or the other one who consults you as to what lens he should buy, and when asked what sort of work he wants to do, "doesn't quite know." Well, even, in pictorial landscape photography one

may get hold of unsuitable apparatus, and a little thought previous to purchases is advisable. The man, not the camera, makes the pictures, as we have emphasized; but this constitutes no reason why he should not employ the most suitable and convenient ways of making them.

### SIZE

If any one will take the trouble to superficially compare landscape prints by, say, a dozen or two average photographers, he will surely find that their distinguishing characteristic is that their makers have taken a great big slice of the world and made it small. All the heterogeneous components of an unselected landscape which an angle of view of some sixty-five degrees includes, — a road, two or three woods, a few hills, some water, a house, probably a cow or two, — all these, or some similar collection, are herded together within the confines of a 5 x 7 print. Now, combinations of many elements can, of course, be handled pictorially; but the difficulty increases vastly with the number of such elements. How is it that it occurs to so few beginners to tackle something smaller, and make a good big print of it? The big print is a great critic; the larger it is, the more its faults howl; *per contra*, at the same time, the more striking become its merits; it thus has an educational and corrective value of no low order. But it is not with this feature of the big print that we are primarily concerned. The landscape worker, we have said, need not expect to be prolific; his prints should be few, the result of much work and ruthless suppression. Suppression becomes much easier and more natural where a finished print involves an enlarged negative! — which is an advantage; but such pictures as the maker has thought worthy of the labor of “working up” into the finished print of large size he will not want to inter in an

album or portfolio. Their destination will be the walls of his home or of his friends' homes, or of exhibitions. Now, mural display calls for a certain generosity of dimension. It must, of course, be recognized that all work has a "scale" of its own; and what scale will show any particular picture to best advantage can be determined by inserting a positive transparency in an enlarging lantern of the projection type and comparing the effect of different degrees of enlargement on a sheet of paper fixed on the enlarging easel. Some little experience and taste are necessary to hit upon the point at which the increase in effect begins to degenerate into the crudeness which marks over-enlargement; and the beginner will find it very instructive to study the effect of progressive increase of size in this manner.

While, then, the pictorialist is advised to work out the size that seems to him most suitable for the presentation of his own work, it may be safely said that most landscape work can be favorably presented in the sizes 10 x 12 or 11 x 14 (or such parts of these sizes as the shape of the picture permits). Our own preference is for the latter size, which seems to us to combine a maximum of effectiveness (in the case of the greater number of our own subjects) with a minimum of the awkwardness and difficulty of manipulation which attend the use of very large sizes. Whatever size be adopted, it will inevitably be such as to preclude the idea of direct work, and will demand the use of an enlarging outfit as an essential part of the equipment. This should be preferably of the projecting type, with a movable easel, so that any portion of the original desired may be enlarged to any desired size. If a lantern of the usual condenser type be purchased, it is convenient to have it of such a size as will take a plate larger than the one for which it is desired to use it. A pair of six and one-half inch condensers, such as

is usually supplied with a 4 x 5 enlarger, *will* cover a 4 x 5 plate, unquestionably; but much manipulation in obtaining "good disc" and a certain amount of bad language will be saved if, for enlarging from 4 x 5, a 5 x 7 enlarger be used, and so on. If one is unable to purchase an enlarger, and cannot obtain access to one when necessary, it is a simple enough matter to use one's camera and lens for the purpose, either by utilizing a daylight illuminator consisting of a piece of ground glass inserted in the dark-room window cover, and provided, on the outside, with a reflector at an angle of forty-five degrees, or by constructing a light-tight box with a ground glass on one end and an artificial illuminant inside at a sufficient distance from the ground glass to evenly illuminate it. Articles on the construction of simple home-made enlargers frequently appear in *American Photography* and other photographic magazines, so we need not pursue the subject further.

The adoption of enlargement for the final picture leaves us with only convenience to consider in the selection of size for a field outfit. Our preference is for 4 x 5; 5 x 7 and larger sizes are cumbrous, and expensive in respect to plates, without any compensating advantages;  $3\frac{1}{4} \times 4\frac{1}{4}$ , and even smaller sizes, are today preferred by many of the best pictorial workers, principally on account of lightness and handiness. There is, however, need for very much greater care in the handling of these extremely small sizes; it becomes much more difficult, for instance, to get exactly the desired quality of focus. Further, the smaller the plate and (consequently) the shorter the focal length of the lens, the more restricted becomes the power of differentiating between the various planes of the subject, except such as are very near, by adjustment of focus. The 4 x 5 size offers a reasonable degree of portability together with convenience and cer-

tainty in focusing, and is, without doubt, the most generally convenient size for landscape work.

### ON LENSES

In pictorial landscape work the nature of the lens has by no means the importance with which it is often credited. Successful pictorial landscape work has been frequently done with a pinhole; it has even, we believe, been done with an anastigmat. As a general instrument for the purpose, the one is, however, probably as inconvenient as the other. The pinhole gives drawing of beautiful softness of outline, but possesses no power of focal differentiation between planes; the anastigmat — well, perhaps a few words may explain why simpler and cheaper instruments are capable of much more satisfactory work and are more convenient for the particular purpose.

Two, and only two, points are of extreme importance as regards lenses for use in landscape work. These are aberrations and focal length. Other points, such as speed, are of relative insignificance. Now the unfortunate thing about the modern anastigmat is that it hasn't any aberrations to speak of. This is unfortunate because, unless you focus on a nearer plane than any in the picture, or out beyond "infinity," the well-corrected lens naturally gives one plane, even at full aperture, which is hard and sharp, and persists hard and sharp in an enlargement, unless measures are taken to "soften off" in enlarging. This can be done, but it is much more convenient and satisfactory, and very much less like guesswork, to get your focus right and of the quality desired in the original negative. The *slightly* erratic lens is what nine times out of ten is wanted, — a lens which has a small amount of spherical aberration, and which gives just sufficient softening of the lines in the plane of sharpest focus

to draw, instead of cutting, the outlines, and to slightly mass the small, insistent, confusing detail, which is one of the greatest enemies with which the pictorial landscape worker has to contend. Of course, useful as aberrations are (in moderation), they have their dangers. No one likes to see a tree against a strong light with a piece bitten out of its trunk, which is one of the many curious things likely to happen to users of lenses with extreme absence of correction, but lenses of the extreme type now referred to, highly recommended by some workers (as used, for instance, by some of the younger secessionists to provide their sitters with double collars), are as rarely of use in landscape work as is their antithesis, the anastigmat.

The second point to be grasped is that the larger the range of focal length available, the wider becomes the scope of work possible, and that the relation between the size of plate employed (which we will assume to be 4 x 5) and the focal length of the lens used is a most important one. It happens that the lenses usually listed for a certain size of plate are of much too short focal length for advantageous use in landscape work. The reason for this is probably to be found in the absurd desire, already alluded to, to get as much of the world as possible on one plate. A 4 x 5 camera will, for example, usually have a 6-inch lens. Now there are undoubtedly occasions on which this is just about what is wanted, but there are a hundred times as many when twice that length is desirable. With increasing focal length the size of an object on the plate increases as the angle of view decreases; the effect of perspective decreases and becomes less violent, and greater focal differentiation between planes becomes possible (i.e., the "depth of focus" becomes less). There is, of course, no such thing as a "proper focal length" of lens for a certain size of plate, but it will be found that,



JERSEY LOWLANDS  
*Photo Pictorialists of Buffalo*



AN OCTOBER EVENING, No. 1  
*Photo Pictorialists of Buffalo*



AN OCTOBER EVENING, NO. 2  
*Photo Pictorialists of Buffalo*





ON EIGHTEEN MILE CREEK  
*Photo Pictorialists of Buffalo*





EVENING

*Photo Pictorialists of Buffalo*





THE ALBRIGHT ART GALLERY  
*Photo Pictorialists of Buffalo*



EVENING SHADOWS  
*Photo Pictorialists of Buffalo*



EVENING SHADOWS  
*Photo Pictorialists of Buffalo*





AN ITALIAN LANDSCAPE  
*F. Austin Lidbury*





THE ROAD TO THE SHORE  
*G. Edwin Keller*



for a 4 x 5 plate, the most generally useful length for landscape work is about ten to twelve inches. It is very unfortunate that so many photographers purchase camera and lens without a moment's consideration of the question of focal length, which is, really, the most important question of all, with the result that too frequently their work is necessarily limited to a focal length giving, on most landscape subjects, foreground material of gigantic size, diminutive middle distance and vanishing distance; the general impression being one of a contracting perspective rushing to a near-by point with enormous velocity. The successful use of short-focus lenses in landscape work is limited to subjects of a certain closely compressible nature and requires even in such cases much experience and care. The beginner will be well advised to go to work with a long-focus lens, and it may even be said that the longer the better. Such a lens will make simplification of subject easy and natural, instead of difficult almost to the point of impossibility, as in the case of short-focus lenses. It takes a little practice to familiarize one's self with the way in which an increase of the focal length affects perspective, and the relation between the magnitude of objects in different planes, but a little time spent in the study of this matter will give an almost instinctive power of recognizing when a certain subject demands a long or short length of focus.

Very suitable and convenient instruments, as regards both aberrations and focal length, are the single combinations of those cheap rectilinear lenses known as "convertible," "trifocal," and so on. Such a lens costs but a few dollars; the doublet has a focal length of about six inches, and is useful on those rare occasions when a fairly wide angle of view is desired; the single combinations are of about ten and one-half inches and fourteen inches length respec-

tively, and afford at least a reasonable scope for all ordinary range of work. The use of the single combinations of such a lens will rapidly demonstrate to any one that for most pictorial landscape work a focal length of about twice the length of the plate, and frequently a still greater one, is required. Of course, the single combinations of such a lens as we refer to are slow, but that is rarely of consequence, and they are by no means perfect scientific instruments, but then that is just what is required, — they possess a quite sufficient number and degree of aberrations to make their use interesting and occasionally exciting! On the whole, such a lens is cheap, convenient, and, for the purpose, as nearly a universal instrument as one lens can be. Other lenses may be indispensable for certain work of an unusual character, but it may be very definitely and decidedly stated that he who cannot make pictures with a lens of the type referred to cannot expect to make them at all. In time the need of other lenses may make itself felt; possibly the photographer will find that now and then he requires a great deal more illumination than his own lens gives him, in order to get sufficient exposure on windy days, when, say, one-tenth second is the most that can be safely given, and lighting conditions are poor. For such emergencies a very fast anastigmat (by this we mean one of  $f: 4.5$  aperture, not  $f: 7$  or thereabouts), becomes almost a necessity, but it should be of as reasonably long focal length as his pocket will stand, say eight inches or over, for a  $4 \times 5$  plate. Of course, such lenses have that painful sharpness in one plane to which we have referred, though some have a "diffusing arrangement" which softens off the definition a little (and it is very little).

Of other special lenses none is so useful as the telephoto. Indeed, after a short acquaintance it ceases to be classed

as a "special" lens, and becomes a regular and much-used companion. Not, indeed, for the production of those curious distant panoramas that resemble nothing so much as stage scenery with its various planes cut out sharp at their edges, but as a lens of extremely long and variable focal length whose usefulness consists in the ability to pick out small portions of landscape in cases where a nearer approach spoils the composition, and in the facts that it enormously extends one's range of work and affords in an extreme degree the advantages we have noted as attaching to the use of long focal lengths. It is unnecessary (and inadvisable) to burden one's self with heavy "telephoto-attachments"; light, complete lenses of the type of the Dallmeyer "Adon" or the Gundlach "Pancratic" add little to the weight of the field outfit, but enormously to its utility.

Finally, there are lenses of the class which may best be described as "fuzzy," which usually consist of a single achromatic combination of much wider aperture than allows of even a half-decent suppression of the effects of spherical aberration. These we have already referred to as having extremely limited application in landscape work, though it ought to be admitted that for rendering certain shimmery effects of light and the dazzle of breaking water they are capable, in the hands of those who study them closely, of extraordinary results. Few care to use them, however, and fewer still are able to learn how.

### THE CAMERA

From the foregoing and other considerations it will be evident that a hand camera is not an ideal instrument for landscape work. Slow lenses, heavy shadows, medium speed plates, the frequent use of a ray filter,—these conditions all point to the use of a tripod; the careful compo-

sition of the picture postulates the use of a focusing screen as clearly as does the necessity, already emphasized, of extremely accurate focusing, by which, of course, is emphatically *not* meant sharp focusing. View finder and focusing scale, if careful composition and accurate focusing are regarded as of serious import (and in serious pictorial work they are of the utmost import), are utterly unreliable guides. Finally, the use of long-focus lenses (e.g., single combinations) requires a much longer draw of bellows than is provided in most hand cameras, or, indeed, in a great many others. We thus arrive at the following requirements: Long (double, or better triple) extension, accurate coincidence of the ground-glass surface with the film, reversing back (since both horizontal and vertical positions are equally used). Other things matter less; once in a hundred times or so front movements are of assistance, though the swinging front, which is particularly useful in long foreground work and probably the most desirable movement, is rarely supplied. The tripod should be strong and *very* rigid; the shutter should have time, bulb and the slower fractional exposures. Cameras filling these requirements are supplied by all makers at very reasonable prices, and though one can buy expensive models if one wishes, the difference in price merely represents a number of not very useful movements and, of course, better workmanship and durability. A word should here be said on the subject of reflecting cameras. If one does not mind the additional weight, such a camera as the 4 x 5 Revolving Back Graflex, which has a reasonable length of bellows, is a great convenience. Its large lens board (easily detachable and capable of accommodating very large lenses) is of considerable advantage to a photographer who carries several different lenses. But its greatest recommendation lies in the reflecting feature. In landscape work, it is true,

the photographer will never find occasion for the use of its speed features, and in fact will usually expose on a tripod. But the fact that he does not have to set up his tripod, but merely to open the camera, whenever he desires to explore the possibilities of a spot, and that by its aid he can as thoroughly explore in ten minutes the compositions which present themselves, as his fellow with the disadvantages of tripod, inverted image and focusing cloth can in half an hour, makes this camera almost an ideal instrument.

#### A USEFUL ACCESSORY

These notes on equipment would be sadly incomplete if they contained no reference to the utility of some form of heavy pocket-knife with which, on occasion, a little judicious pruning can be done. It is a great deal easier to remove a disturbing feature from the landscape than to remove its image from the negative. Stones can be rolled away, twigs can be broken off, but there are times when the absence of a branch, or some heavy underbrush, or even a small tree becomes desirable. In such cases a heavy knife is of great assistance. Pruning trees is often just as essential a process in the making of a landscape photograph as focusing is, and the pictorial landscape photographer must also now and then be a landscape gardener, and he should arm himself accordingly!

## CHAPTER III

### ON FIELD TACTICS



O much talk and futile discussion have been perpetrated about photography as an art that it is a distinct pleasure to discuss a phase of the subject in which, it must in honesty be admitted, the features of sport are much more in evidence. Camera work in the field, indeed, has all the characteristics of a first-rate sport; and it would perhaps not be inaccurate to suggest that it is this element which exercises so potent a spell over the real devotees of landscape photography, and makes it almost true that "once a landscapist always a landscapist."

For the successful pursuit of any sport one requires natural aptitude, experience and persistence. Granting the possession of these, we must proceed to admit that there is another and most important factor — luck. All these elements enter into landscape photography. It is the persistent, all-the-year-round worker who will in the long run have the most and best results to show; but it is also he who will experience to the greatest extent the discouraging effect of days or even weeks of futile effort, as well as the occasional intense gratification of sudden and perhaps unlooked-for success after, possibly, just such an unproductive period. It is unquestionably this element of luck, of uncertainty, that compensates for the relative smallness of "haul" in landscape work by adding to it the attractions of a sport.

As regards the photographer's personal equipment, we are carefully going to avoid any attempt to explain the unexplainable, to describe ways to acquire natural aptitude, to tell how to "see pictures." The natural power of finding "that something that was not there until you saw it" (as Mr. Todd once so finely put it in *American Photography*) is incommunicable. You have it or you have it not. Of course latent ability can often be developed by the personal advice and cooperation of experienced workers; also, of course, like all natural gifts, it grows with practice. But it assuredly cannot be taught.

It is probably permissible, however, to discuss certain phases of field work which are more or less those in which experience is of assistance; and the following notes may be useful in spite of the fact that many of them have little claim to novelty.

#### WHERE AND WHEN

When the landscape photographer makes the discovery that "scenery" does not afford a satisfactory basis for pictorial work, he is in danger of rushing to the opposite extreme and proceeding on the principle that the subject is of no importance whatever. This idea has been fostered by many writers who should have known better; and it seems, very unfortunately, to have been widely accepted as axiomatic. Now, as we have already stated in our first article, it is possible to make a very interesting picture from a very uninteresting original. Real success in such procedure is, however, exceptional; it must necessarily be so, because it requires the possession of a degree of creative artistic feeling which is very unusual; and it ought to be so, because the proper use of "interference" in pictorial photography is for the development and not the creation of the essential char-

acter of the picture. In other words, while we concede that there are pictures "made out of nothing" which justify the fact that the whole of the interest is due to non-photographic interference with the original result, we hold, as a general principle, that the originals themselves should possess features of interest, whether of design, tone or other qualities; and that the province of interference is to increase the interest of the original conception by strengthening these, by subduing or removing disturbing or contradictory elements, and by pulling the whole picture together into a state of unity, exhibiting what may be termed the idea of the picture. We wish to offer this article of belief for the serious consideration not only of beginners in pictorial work, but of the large number of advanced workers throughout the country, including many whose well-deserved reputations would seem almost to make it an impertinence to address criticism to them. But the fact is that the American amateur gets too little criticism of the right sort, of the sort, that is, that goes down to the root of things; and we hope we shall be pardoned for observing that a great deal of landscape work, fully representative at any rate of what is being done in the Eastern States, has come before us within the past two years and has been almost uniformly characterized by lack of interest, of idea, in a word, of pictorial quality. One gathers from these photographs the impression that instead of attempting to secure something interesting and expressive in the way of material, and enhancing its expressiveness by manipulative skill, the attempt has usually been to impose on an ordinary, uninteresting and unbeautiful subject some inappropriate or impossible effect, with the almost inevitable result of complete failure.

Having postulated that the subject of a landscape photograph should usually possess *some* intrinsic interest in its

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original form (i.e., as a straight print), we advise that a deaf ear be turned to the facile generalization that pictures should be made out of the material at one's back door, as it were. On the other hand, our friend Mr. Snowden Ward was undoubtedly right in deprecating the tendency to run hundreds or thousands of miles in search of material. At the risk of repetition, we would emphasize that *the best results and the most frequent successes are obtained from landscapes with which the photographer is thoroughly familiar*, and that the longer he has worked a promising spot the more probable it is that he will obtain results there. The best plan is to limit one's activities to a radius sufficiently small to permit of frequently visiting any particular spot that may be found pictorially interesting, and when such spots are found, to visit them frequently, at different periods of the year and under various lighting and weather conditions. What constitutes a pictorially interesting spot varies with the tastes and tendencies of every particular worker. Such spots are to be found in the most unexpected places, and the search for them forms the most arduous as well as perhaps the most interesting feature of the pursuit. The existence of one or more interesting conditions, such as graceful tree lines, characteristic tree forms, an irregular or otherwise attractive distance, the presence of water, masses so placed as to suggest the possibility of interesting spacing, these and many similar conditions too numerous to specify constitute, particularly when several are found in combination, pressing invitations to pause and study. It is really of minor importance if disturbing elements are also present; they frequently are; and though their elimination is necessary by selection or removal (*in situ* or on the plate), the best opportunities will be missed if their presence causes the photographer to refrain from exposing on an otherwise promising composition.

Of equal (one might say of greater) importance are meteorological conditions. Generalizations on this point are difficult, because those conditions which are best at one season of the year are not best at another. A pretty safe rule, however, is to disregard weather predictions in any case. They are, as every one knows, usually incorrect; and the unsettled weather conditions which are apt to frighten the timid into staying at home are not infrequently those under which the finest atmospheric effects may be secured. In winter possibly this is not altogether true. A snow picture which has not been taken under a strong, low light, such as throws into relief the inequalities of surface, rarely if ever has any "snow quality"; and for this reason success is infrequent on dull winter days. In spring, and to a large extent in fall, dull days are, on the contrary, sometimes those on which soft, rich atmospheric effects can be best secured. In summer the clear, cloudless, brilliant days, that is, during the midday hours, — when the vast number of camera users are most busy, — are often the most hopeless. Misty and foggy days are full of glorious opportunities. On sunny days, and indeed on nearly all days, the best times for work are the first three hours after sunrise and the last three hours before sunset. At these times the low, oblique illumination furnishes broad light and shadow masses of extreme interest; and, particularly in the earlier hours, there is apt to be a misty softness of distance, the value of which only the experienced worker can fully appreciate. One other word of advice may be given on this subject, — *travel towards the light*. Landscape which is highly uninteresting and photographically hopeless under flat, direct lighting or spotty overhead lighting shows possibilities to the eye which views it from a point towards which the shadows stretch, and from which the possibilities for composition

afforded by the broad masses of light and shade can be observed.

### ON THE SPOT

We will assume that we have attained the combination of "the time and the place and the camera all together." The first thing to do under these circumstances is to *set up the camera*. It is foolish to hunt for composition with the eye. The four edges of the ground glass form an auxiliary to composition of which the eye is quite devoid. We are looking for compositions that look well, not with reference to the indefinite edges of the angle of vision, but with reference to the four edges of the ultimate print; and in this respect the limitation of field formed by the edges of the focusing screen is of invaluable assistance. We do not, of course, mean that the camera should be pointed indiscriminately, but that once the eye has decided that a landscape viewed from a particular direction has pictorial possibilities, immediate recourse should be had to the camera. The appearance of the image on the ground glass will at once suggest changes in position to the right or left, forward or backward, upward or downward; and each change brings its variations in the composition and suggests further changes. It frequently happens that interesting compositions are seen to occupy only a small portion of the focusing screen, an indication which leads to the substitution of a lens of longer focus. Investigations of this sort are by no means to be limited to changes in composition and line; the power of varying the quality of definition, and of differentiating by focal adjustment between the near and distant planes, gives an enormous control over the nature of the picture, and one which we should not be slow to take advantage of. There is no need to have "ideas" on the subject of focusing;

indeed, unless you prefer discussions on the eternal *sharp* vs. *fuzzy* question to the making of pictures, they are very inconvenient. The one reliable guide in focusing is the question, "*Does the effect look right?*" If the effect on the 4 x 5 focusing screen is what you want to get, the effect on the 11 x 14 print will also be what you want. Too much time cannot be spent in arranging the composition and quality of focus of the picture. It is at this point that the character of the picture is determined, and a little time may make all the difference between a picture and a spoiled plate. No one who is familiar with the difference which can be made in the lines of a picture by moving the camera a few inches to the side, or up or down, or with the change in effect produced by a slight difference in focal quality, can fail to recognize the extreme importance of the utmost care in these respects. When the general features of a picture as seen on the screen appear satisfactory, it is wise, before exposing, to look carefully for details which might be improved. At this point a little exercise in landscape gardening is not infrequently suggested. There is no reason to include any removable feature of the landscape merely because it happens to be there; and, on the other hand, if an accent can be desirably added by, let us say, the skilful addition of a few wild flowers to the foreground, now is the time to do it. It is really, as the straight-print cranks are never tired of pointing out, often easier to get your subject right before exposure than to draw about half of it in afterwards; and yet many seem to have a weird idea that there is a sort of artistic dishonesty in trimming up a landscape; why, it is not easy to see!

There is one wrinkle which frequently proves useful, namely, the use of a ray-filter on the lens during the inspection of the image. This eliminates to some extent the decep-

tive effects of color, and assists in obtaining a rough idea of the tone values involved more easily than without the use of the filter. Of course a green filter gives, strictly speaking, a more accurate idea of the landscape as seen by an orthochromatic plate through a ray-filter, but the ordinary yellow filter is of considerable assistance in practice in getting rid of the alluring and disturbing influence which the colors of the subject exert on the eye. It is very easy to waste many plates, particularly at certain seasons of the year, on subjects which lose all their interest when translated (even with the best panchromatic accuracy) into monochrome. On the other hand, the use of a screen for viewing as above suggested will not infrequently encourage work in cases where, owing to the confused color effect, the subject does not look even ordinarily satisfactory to the normal view.

#### ON TECHNIQUE

And this brings us to a consideration of plates and similar matters. Our own preference is for Orthonon plates, which we almost always use in landscape work. There are now several other brands of the same type of plate — orthochromatic and double coated, the emulsion being very considerably faster on the surface than in the lower layer — on the market, but we have had little experience with them, though no doubt they are equally suitable. There is, we think, no question but that this type of plate is by far the most suitable for general landscape work. It shares with film the advantage that halation is reduced to a minimum; whereas the single-coated plate, unless backed, or stained like the Lumière non-halation plate, is in this respect a weariness to the spirit. It ought not to be necessary to point out that the halation problem is constantly with the landscape worker; and the importance of using either double-

coated plates, or films, or backed or stained plates, cannot be exaggerated. Our preference for the double-coated plate, of these classes, arises from its adaptability to the most various conditions of working and its extraordinary latitude. It is orthochromatic; it is capable of being used as an extremely fast plate, provided suitable soft development be resorted to; and it is capable of rendering a scale of gradation beyond that possible to a thinner and more uniformly sensitized emulsion; it is, finally, capable of extreme latitude in regard to exposure. It is, in a word, the only type of plate which *fully* meets the extreme variety of conditions met with in landscape work.

There is, in practice, very little difference between an orthochromatic plate and an ordinary plate unless a ray-filter be used; and a ray-filter should be part of the landscape worker's equipment. Our object is not to get scientifically accurate tone rendering, or indeed anything like it, but to have an instrument which will enable us, when we wish, to depress the abnormal effect of the violet and blue rays on the plate. For pictorial work the ray-filter, though more often indispensable than not, must be used with caution, with understanding, and with reference to the effect which is desired. Very heavy screens are undesirable; a six-times or eight-times screen, or even a lighter one, being the most useful. When to use a screen is a matter to decide in each individual case. It is rarely useful unless full and ample exposure can be given, and where it is desired to use it with an insufficient exposure (owing to movement, for instance) a duplicate exposure without the screen may be wisely made. In such cases the latter is apt to produce the more useful negative. For securing clouds and very faint distance, the screen cannot be dispensed with; but it is very easy to overdo its use in "holding distance" in cases where

the distance is not faint, and its indiscriminate use in such cases is liable to lead to a destruction of tonal differentiation between the planes of the picture, and the conversion of what should have been rendered as an interesting and soft distance into an unattractive, hard, and insistent mass. It is also very easy so to use the screen as to give to light green foliage an unduly light appearance, which, though it may be a closer approximation to visual appearance, is not always what is wanted. These points are mentioned to emphasize the necessity for caution in this matter; and it is always advisable when working on a promising subject under conditions which make it doubtful whether the use of the screen is proper, to make duplicate exposures with and without.

The ability to correctly estimate exposures is so much a matter of personal experience that little can be advantageously said on the subject. The variation in effect with variation in exposure is something that should be carefully studied. In pictorial work the "correct exposure" is the one that gives the nearest approximation to the desired effect, and has nothing to do with the "correct exposure" of the technician. The boldness obtained by underexposure and (more frequently) the softness obtained by overexposure are really just as likely to be what one is aiming at as the full gradation of the technician's negatives; in fact, much more so. Here again, in case of doubt, it is advisable to make sure by duplicating exposures; but it is to be remembered that to make *very* much difference in the quality of the negatives the exposure should be multiplied or divided by three or four. Negatives made with exposures varying, say, as 2, 3, and 4 are apt to look pretty much alike. It is, finally, advisable to learn to judge the necessary exposure from the appearance of the image; it is astonishing how easily this faculty can be acquired, and how reliable it is. The exposure meter

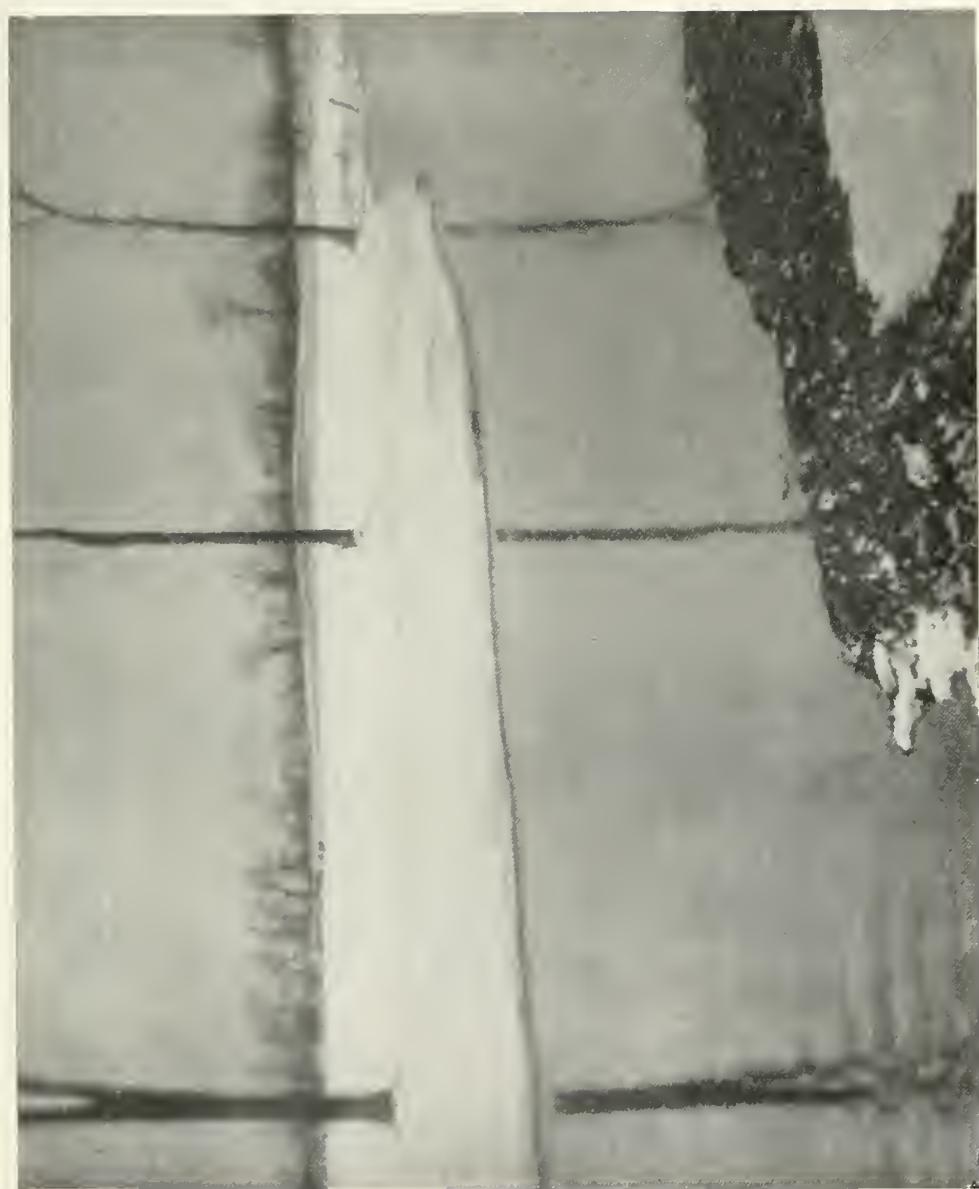
leaves a little too much to the imagination; its *modus operandi* has been well described as turning a few cranks, reading off the result, and then — using your judgment. It will be found more satisfactory to learn to use your judgment directly, especially as the result you are trying to get is not the “average negative” of the books.



THE SILVER STREAM

*G. Edwin Keller*





WINTER  
*F. Austin Lidbury*





**MOONLIGHT**  
*Oscar C. Anthony*





A SUMMER DAY

*Oscar C. Anthony*





THE RISING WIND  
*Charles Booz*





TREES OF LOMBARDY  
*W. H. Porterfield*

ME  
UBL



WHERE THE IRIS GROWS

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Edward B. Sides





A WINTER LANDSCAPE  
*W. H. Porterfield*



## CHAPTER IV

### THE NEGATIVE AND ITS ENLARGEMENT



OW it is necessary to consider some of the technical processes which intervene between the selection and composition of a picture and its appearance as a finished print. It is perhaps not necessary to point out that the technical problems which confront the pictorialist are at least as difficult as — indeed, they are usually more so than — those which the technical photographer has to deal with. For while the latter is usually only concerned with the normal aspects of photographic processes, the former has on many occasions to work in the byways and hedges of photographic technique, and requires all the assistance which his experience of the abnormalities of his processes can give him. It is, to take only one very simple instance, very much easier to make a negative of a given subject which shall conform to the usual idea of a perfect negative (i.e., one having a full scale of gradation, with unclogged lights and shadows clear, but full of detail) than it is to make a negative which shall more closely render, not the actual visual tonality of the subject, but that aspect or phase of the tonality which the worker wishes to represent. A thorough technique in the widest and best sense of the word is just as requisite for pictorial success as the pictorial sense; and it may be confidently stated that no pictorial photograph is or can be a pictorial triumph which is not at the same time a technical triumph also.

Assuming that you have something to express, the degree of expression depends entirely upon your technical knowledge, experience and ability. You may have the most brilliant and original ideas, you may be able to see, select and photograph the most astonishing and beautiful compositions, *but* — it is only the effect that you finally obtain on your finished print that the observer will see, and your idea will be just as effective as, and no more than, you are able to make it. No step in the processes is therefore negligible; and though skill in printing is probably the most important factor in technical expression, no amount of this will compensate for an unsuitable quality in the negative. We cannot pretend in a series of chapters necessarily restricted in extent, to cover the technique of the common photographic processes, nor is it necessary to add to the already sufficiently long treatises on such subjects, and consequently we will limit ourselves to a few guiding principles.

#### EXPOSURE

Both in exposure and in development full advantage should be taken of the possibility of varying the result to suit the effect which the worker has in mind. What would be the "correct exposure" according to the books is not necessarily the correct exposure for the result desired. After all, correct exposure is a relative term, and if what we want is not a negative with full gradation, but one with a soft, compressed scale, a much fuller exposure than usual would be proper; and on the other hand, if the effect we wish to secure depends on the emphasis of fine gradation of tones in the lighter portions of the composition, we shall certainly have to reduce exposure correspondingly, and let the shadows look after themselves. A clear knowledge of the effects of wide variations of exposure on the gradations of the negative (and it is now universally recognized that the exposure

settles the relation of the tones once for all and irrevocably) should be acquired experimentally, and the question of exposure for any particular subject settled on the basis of what is desired. It must, of course, be granted that not infrequently a negative exposed with a certain idea in mind is afterwards worked up into something very different, and when we are told that "that is just the effect that I had in mind when I made the exposure" we are apt to adopt a Rooseveltian attitude of mind in regard to the speaker's veracity; but it is, on the other hand, an obvious fact that there is in any subject on which an exposure is made some quality which led to the selection of the subject, and it is consequently usually advisable in settling on the exposure to bear in mind this particular quality, and to give such an exposure as will retain it, even if this has to be done at the expense of some other, non-essential quality. One meets occasionally, as, for example, in the alluring and very common subjects involving looking out from heavy and poorly lit shade masses into a brilliant and delicate distance, problems which seem to involve the loss of character of either shadow or light gradations, and in such cases one is confronted with a choice of sacrificing to some extent the less important, or of attempting, either by making two widely differing exposures, and subsequently combining the results, or by radical and extensive manipulation in subsequent stages, to add the character which had to be sacrificed in the first exposure. It must be added to this that the use of double-coated, orthochromatic plates and a ray-filter reduces the frequency of this dilemma, and limits its appearance to the most extreme subjects only.

#### DEVELOPMENT

The same principle which is above recommended in deciding the exposure — that of suiting it to the complete

rendering of the particular tonal character which it is desired to express — may be extended to development. We are no disciples of mechanical development for pictorial work. It is of course perfectly true, and has been abundantly proved, that the relation of the tones of the negative is fixed by the exposure, and that no amount of monkeying in development can do very much in the way of altering them. But it is also true that modification of the strength and time of action of the developer can very considerably affect the amount and nature of the silver deposit, and that very considerable differences in the printing values can be obtained by differences in these details. In the first place, the time of development is of considerable importance as affecting the degree to which the separation of the tones is carried; and the proper time of development will depend on the appearance of the image in a way which precludes it from being determined in a satisfactory manner before the commencement of development. In cases where the image indicates that exposure has been insufficient, as also in cases where a short exposure has been given with deliberate purpose, it is often useful to stop development when only a faint image is yet on the negative, for the purpose of preventing too great a degree of contrast between the high and low tones. In cases where a full exposure has been given, it is most useful to avail one's self of the power of checking development when the eye tells one that the proper degree of density has been obtained, bearing in mind that prolongation of development always increases the degree of contrast and brilliance of the print, and that softness and compression of the tones can only be obtained by short development. It is inconsistent to give a long exposure with the deliberate intention of compressing the high tones, and then to prolong the development until a hard negative results.

It is probably the besetting sin of most amateurs that they do, in many cases, tend to carry the development too far. A great deal can be done with the merest ghost of a negative. It is a very easy matter to lengthen the range of gradation in making the transparency and enlarged negative to almost any desired extent and at either end of the scale; but it is a heartbreaking task to start from a negative which has been developed hard and with an extremely wide scale of tones, and attempt to compress them into a soft and even scale. A pretty good general principle in pictorial photography is therefore to keep the original negative thin and soft; and there is no worse enemy to the soft negative than the strong developer. While we use one developer, another another, in the most diverse way, we agree in sticking each to some one particular developer and formula, and in using very dilute solutions. It is astonishing to one who has not made the experiment what a great degree of softness a negative developed in a dilute developer shows as compared with a negative developed to the same extent and density in a stronger solution of the same developer. This appears to be due to a difference in the nature of the silver deposit, and, in the case of some developers, of which rodinal is a good example, a hard or soft negative can be made almost at will by using a normally strong, or a five-times diluted solution. These possibilities of influencing the character of the original negative as regards its printing qualities ought to be taken full advantage of.

We prefer the enlargement of the negative to direct enlargement not only because we are thereby enabled to employ methods of modification not possible in direct enlargement, but also because the enlarged negative permits the choice of any printing process, and, even if non-photographic interference be not resorted to, permits also considerable varia-

tion from the original negative in photographic quality. The introduction of the bromoil process seems to promise much in the way of astonishing results via direct enlargement, but as far as we know it has not yet been taken up in America with either seriousness or success. Unquestionably it will be before long; but in our opinion it will prove in landscape work at least, rather an occasional process with unapproachable opportunities for modifications, wise or unwise, than a general printing process. As far as our knowledge of the process goes (and we readily admit that this is small) it does not seem to offer any substitute for the innate beauty of appearance which a good carbon print possesses, and which seems to us to be by no means the least factor in the preëminent suitability of the latter process for landscape work.

#### MAKING THE POSITIVE

The making of a good transparency is as easy a matter as the making of a good Velox print. The important thing to grasp in this connection is that a transparency which possesses the character of a lantern slide is of no use whatever for the purpose in hand. Thin, clear diapositives as a rule possess absolutely no enlarging value; in particular, they lose in the enlargement all lighter tone quality. It is necessary to produce a transparency which has sufficient strength in the lighter tones to carry them through the process of enlargement, and this demands that the exposure in printing the transparency must be sufficiently full, and the development sufficiently prolonged, to give a quite appreciable thickness of deposit even in the very highest lights of the picture. Such a transparency, to one accustomed to the appearance of lantern slides and the usual order of transparency, will appear thick, muddy, and heavy; but experi-

ence will soon indicate that only a fairly strong deposit in the lighter tones will permit these tones to be properly reproduced in the enlarged negative. Any transparency which is of "enlarging quality" is not necessarily, however, the right one to use. We have here the first, easiest and cheapest opportunity of varying the photographic quality of the original negative. The matter is exactly parallel with the making of gaslight prints; by variations in the time of exposure, in the intensity of the light used in printing, in the strength of developer, and in the nature and speed of the plate used, most astonishing changes can be made in the degree of extension of the tone scale, the extreme ends of the scale being at the same time relatively compressed, extended or unchanged, according to will. The factors, being the same as in the making of gaslight prints, with the exception of the plates employed, are pretty well known, and we probably need only state that a couple of different slow plates, say Seed's 23 for most subjects, and "Process" plates for subjects in which a considerable amount of strength and shadow depth is required, will give all the range of variation that one is likely to require, at any rate if full advantage is taken of the fact that a short exposure to a very strong light will give a much flatter result than a correspondingly long exposure to a weak light. It will usually be necessary to make several transparencies, and in some cases to make very many, before one is obtained which has the right tonal effect; and when one shows the tonal range desired when held against a fairly bright light, say the sky, it may usually be accepted, and proceeded with.

Here, as everywhere, the pictorialist must not be afraid of varying his conditions (those enumerated above as the factors affecting the result) widely. Changes in exposure by three or more times, wide changes in the source of light, say

from a candle at a considerable distance for a very long time to a 32 c.p. lamp at a short distance for a second or less,—such variations as these give enormous variation in the resulting diapositives, and the experimentally acquired knowledge of the nature of these changes ought to be a part of the pictorialist's technique. There is no step in the whole chain of processes in which there is such enormous power of modifying, in a purely photographic way, the tonal quality of the picture. It does not matter in the least, after the transparency is made, what the original negative was like; we have now reconstructed the original subject in a manner, it may be hoped, a little more to our taste, and what we have now to do is merely to photograph that reconstruction, possibly with further modifications which will now be usually local, on an enlarged scale. Barring such local modifications, this operation will, if we have succeeded properly in getting the right sort of transparency, be practically a mechanical one. Our reconstruction may be in the direction which was suggested by an idea at the time the original negative was taken; it may just as easily have been suggested by the study of a print from that negative (and it ought to be clear that there is just as much credit due to the photographer who can recognize possibilities for treatment from a print as to one who can recognize possibilities in a subject before it is photographed, and that there is no merit in sticking to one's original conception or idea if a better one is suggested by the study of a proof print). The reconstruction may take the form of flattening out the dark tones and converting what was a white and brilliant sky into a dark one (on which, when the enlarged negative is made, suns, moons, clouds and all manner of meteorological phenomena can be grafted); it may take the form of a slight but quite definite extension of the tonal scale for the purpose of emphasizing the tonal

differential of the planes; it may consist of the compression of the scale of the higher tones in order to increase the softness of a not quite sufficiently mist-bathed distance; these are some of the numerous modifications — all, so far, purely "straight" photography — which are suggested, differently in every particular case, by the subject in hand.

It is an excellent plan to make a point of studying the positive in the enlarging lantern. For this purpose a printing frame, of the size which is to be used for the enlarged negative, is provided with a sheet of white paper, and placed upon the enlarging easel. It is better if the edges of the frame are blacked. The image of the transparency is then thrown upon the screen provided by the paper, and can be studied carefully with advantage. It can now be decided by the easiest and most satisfactory method of trial what trimming, if any, is necessary, and the degree of enlargement and position of the printing frame can be so arranged that most of the trimming is done by excluding the superfluous portions from enlargement. Further, by the prolonged inspection of the full-size image it is very easy to determine what interference with details will be necessary, as well as to obtain a pretty fair idea of the general procedure which will be necessary in enlarging and printing to obtain the desired effect. The value of the study of the full-size positive image on the screen prior to enlargement is difficult to appreciate until one has given it a trial.

#### THE ENLARGED NEGATIVE

Very little need be said on this subject. The more attention the photographer has given to obtaining a proper dia-positive which adequately represents the particular photographic qualities which he is trying to introduce into his picture, the less trouble he will have in getting a proper en-

larged negative. Of course he cannot expect to get in the latter any quality which he has lost in the former. The supposed necessary "loss of quality and gradation" in enlargement is mostly fiction, and the trouble which so many workers undoubtedly do experience in enlarging negatives lies in the fact that they are not sufficiently careful to get a good "enlarging" positive. Where the positive has sufficient "body," it ought to be possible to reproduce in the enlarged negative all the tonal gradations which the worker can see on the screen. Failure to do so is usually a matter of incorrect exposure, and demands merely another attempt. Of course the tonal scale can be varied in enlarging, and what has been said above with reference to the production of the original negative applies here with equal force. But the truth of the matter is that the important point in connection with the enlarged negative is to properly adjust its quality and density to the particular printing medium which is going to be used and which by this time ought to have been decided on. This is quite sufficient in itself, and it is better to concentrate on this problem, and not attempt at the same time to compensate for imperfect success in producing the proper kind of positive; a much more suitable remedy for which, as well as an infinitely easier one, is the production of a new and better positive. In deciding whether a thin or fairly dense negative is wanted, whether one with clear or slightly veiled shadows, and so on, we have to consider the idiosyncrasies of the particular printing process we intend to use, with reference at the same time to the effect we desire; but we have also to consider whether the ideas of treatment we have decided on demand interference of such a nature as to require the backing of the negative with tracing paper or some similar medium for the purpose of pencil or stump work. If this is the case, it will have a very decided influence on the nature

of the negative which we should try to produce; the negative should be much thinner than if it is to be used without such a light-absorbing backing. The amount of strength which can be added to a thin negative by a sheet of semi-translucent paper is quite sufficient to make it necessary to allow for it, and a normal negative so covered may not infrequently give too hard a print.

Unless the final print is designed to possess a very full scale of gradation, from the highest to the lowest tones, and this without the raising of the highest tones by work on the back of the negative, almost any plate is suitable for the enlarged negative; and in the few cases where a natural wide scale is required, double-coated plates will prove the best. With regard to exposure, it saves the expense of large plates if trial exposures are made with small plates on some portion of the picture involving, if possible, the highest light and darkest tone, but in any case the latter; and the point previously made should be borne in mind, that to get any appreciable amount of variation in the nature of the negative, small changes in exposure, such as giving half as much again, are of no use.

We have not considered at all in this chapter the subject of non-photographic interference, which will be treated in the next. The purely photographic modifications which we have described are capable of very extensive and very effective use — how effective is shown us by the frequent criticism of many of our “straight” prints as “faked,” a criticism which is a constantly recurring source of amusement of which we would not like to be deprived!

## CHAPTER V

### MODIFICATION OF THE NEGATIVE



COMMENCING an article on modification with a defense amounting almost to an apology is fortunately no longer necessary. Very few, if any, photographers retain the old type of prejudice against non-photographic interference, and the very obvious proposition, that if *any* such interference is to be permitted, there can be no logical limit placed to the extent to which it is permissible, has had to be generally admitted. It follows that there is open to the pictorial photographer a whole series of vehicles of expression, from the perfectly photographic "straight print from a straight negative" to an almost completely non-photographic form of print — if the word "print" can be stretched so far — in which but little use has been made of the photographic image, and which bears a much closer relation to a water color or a crayon sketch than it does to a photograph pure and simple. Now there is no moral or aesthetic reason why any particular stage in this series of vehicles of expression should be considered the limit beyond which the pictorialist must not go; and it is consequently open to him to use any amount of interference whatsoever, even to the extent of painting in practically the whole of the picture.

The question today, indeed, resolves itself into one of justification by works; the means by which a picture has been produced are of no importance to any one but the pro-

ducer, and it is the result, and the result alone, which justifies the means employed. A pictorially meaningless straight print is just as bad as — no better and no worse than — an equally meaningless gum or oil print. The cardinal principle is the use of just those methods which will give the nearest concrete approximation to the worker's intentions. Several important corollaries follow therefrom. They are rather of the nature of truisms, but in practice they are neglected by so many workers that it will do no harm to emphasize them. In the first place, there is no merit in interference itself; and unless it is undertaken with a view to a definite improvement in the expression of the idea of the picture, and carried out successfully from this point of view, it had better be omitted. It is very easy for the beginner, especially, to fail to note, in his pride in his new-found weapon, that his use of it is perfectly futile; and this state of mind is closely allied to that sometimes found in the older worker who confuses the ability to make radical alterations with ability to turn this power to pictorial use. Interference itself is but a method; and it may be used with the exact opposite of pictorial success. An excellent instance of the inability to recognize when a departure from photographic methods is *not* attended with success is to be found in a large number of the so-called multi-color gum prints which were formerly common phenomena in portfolios and at exhibitions. With few exceptions these prints, in which their makers took an obvious pride as pictorial successes, were when viewed — as they should be — without reference to how they were made, disgustingly crude jumbles of the ugliest color combinations, with an astonishing resemblance to a child's first messes with crayon and with about as much relation to pictorial beauty. Even the exceptions — and they were few — raised the second point, which is also suggested by not a little of the most

advanced and successful work in both the gum and oil processes, and that is, how far is the expression in these works of any photographic origin whatsoever? Could not a worker capable of such artistically controlled modification express his ideas with at least as much success in a more direct medium, by the pencil, the etching needle or the brush? To one gifted with the aesthetic feeling and manual facility shown by the productions referred to, the very indirectness and comparative clumsiness of interference in photographic processes must act as a drag on the wheel. Photographers may as well be candid and admit that their tools are after all clumsy and imperfect, and not at all likely to be chosen for the purposes of expression by men with the temperament and the training and manual facility of artists. Of course the case of Steichen will at once be quoted against this idea; but his case proves no more than that an artist *can* use photographic processes with pictorial success. In fact it is a matter for speculation whether Steichen's art may not have lost through his divided allegiance; in which connection we once heard a well-known art critic remark that "he makes photographs like paintings, and paintings like photographs." Which brings us to the third point: Since a photograph cannot imitate, except in a very inferior and unsatisfactory way, the qualities of a drawing or a painting, whereas there is inherent in photography itself the specific charm of that unbroken series of tones which we call "photographic quality," those methods of interference are best which leave intact the charm due to this quality. We do not wish to dogmatize on this subject, and we readily recognize that any worker, who finds that he can get a closer approximation to his ideas of expression by sacrificing this quality to others, is not only justified in so doing, but *ought* to do so. We value so highly the charm of photographic quality, however, as

being that something which nothing else has in common with photography, that we ourselves rarely if ever feel this temptation.

#### ADVANTAGES OF THE CARBON PROCESS

As we have already indicated, there is no printing process which is capable, in the case of most landscape subjects, of giving to the same extent as a carbon print this peculiar quality and charm. The carbon process is capable of very considerable modification in printing, both as to general effect and as to details of effect, as will be shown when that process is discussed. It is, however, necessary to rely, at any rate for considerable modification of the *relative* tonal values, on modification of the negative, and while such modification requires rather more practice than modification in such printing processes as gum and oil, owing to the fact that the changed tones are seen in the negative, and not the positive phase, during work, there is the very great advantage that the modifications repeat themselves in duplicate prints, instead of, as in gum and oil print modifications, never repeating themselves. General changes of tonality in the production of the enlarged negative have been considered in the last chapter, and we shall now discuss modifications of a more particular nature.

All proper modification being in pursuance of a plan definitely decided upon, it is necessary, first of all, to get a perfectly clear idea of what is to be done. A transparency is made of the proper general quality, thrown on the screen of the enlarging lantern, and the image studied until it has been decided in what respects the picture can be improved. A still better method is to make, on gaslight paper of rough or matt surface, a print (also of the proper general quality), and study the print from time to time, finally making such

alterations as appear advisable by scratching out with a penknife, adding with a pencil, and changing tones with both. The roughest sort of work will suffice, and when the modifications have made the print satisfactory in general features, nothing remains but to carry the alterations out in the positive or final negative.

The original negative should rarely be interfered with. It is obviously possible to make any alteration equally well in the enlarged negative, with the additional advantage that the work on the latter is not nearly so likely to show in the finished print. Possibly the only exception to this is the case when it is advisable to have some strong, introduced light accent in the positive itself, for the purpose of assisting the worker to make the subsequent modifications harmonize therewith the more easily. This can be done by work on the back of the small negative before the printing of the positive. In no case is it advisable to work on the front of the original negative; this involves a quite unnecessary, even if slight, danger of spoiling it.

#### CHOICE OF METHODS

In working on positives and negatives it is to be remembered that it is a great deal safer and easier to add to the depth of the deposit than to reduce it. There are numerous intensifiers and reducers which are capable of local application. Local chemical alteration, however, adds to the necessity of placing the medium on the right spots the further necessities of keeping it from spreading, and of checking the extent of its action at precisely the right moment. Both these latter conditions are so extremely difficult to fulfill that it is much better and more certain to use for local alterations no chemical methods, but such entirely manual methods as the pencil, the stump, etc., which are free from this class



THE MISSION TOWER  
*Edward B. Sides*





INDIAN SUMMER  
*Charles Booz*





STUDY OF A HEAD  
*Augustus Thibaudeau*





STUDY IN TONES  
*G. Edwin Keller*





A SENECA MAIDEN  
*John M. Schreck*





AN ITALIAN WOODLAND

*W. H. Porterfield*





MORNING SUNSHINE  
*Oscar C. Anthony*



A SUMMER SQUALL  
*W. H. Porterfield*



HOMEWARD  
*W. H. Porterfield*



of difficulty. It follows that the lightening of tones, or the removal of dark objects, is best effected on the enlarged negative; on the other hand, for darkening tones, removing light objects, and other similar work a choice is offered between doing so on the positive or on the finished print. The carbon process, and indeed many other printing processes, offer the possibility of "painting in" to an enormous extent, and whether the work is to be done on the positive will largely depend on its nature. If it involves the addition of more or less indefinite forms, such, for example, as the breaking up of a patch of white sky, it can very conveniently be done on the positive. If, on the other hand, the alterations must have a considerable degree of definition in the finished print, it is difficult to carry them out here so skillfully that they will not show in the final result. The *modus operandi* is to attach to the positive (back to back) a fine piece of ground glass, or, better, a sheet of the prepared surfaced gelatine, which is now to be purchased for this and similar purposes. Additional deposit is placed by penciling on the ground surface, and the separation of this deposit from the film will throw it out of focus slightly in enlarging, and so soften off the edges and imperfections of the work a little. Of course work can be done on the surface of the film by the use of retouching varnish, or, if a copying ink pencil is used, without varnish, but care must be taken in such cases, though to some extent any imperfections which appear on enlarging such work can usually be corrected by a little retouching of the enlarged negative. It must be pointed out that the combination of positives will occasionally form a useful method of procedure. The same subject can be very considerably strengthened by the combination of two rather flat positives, and different subjects can be most easily combined at this stage. The method is the same as has long been

used for the addition of skies to landscape in lantern-slide work, and is sufficiently well known to require no description. It may be pointed out, however, that in most cases it is not necessary to place the different transparencies face to face, and that one is not limited to the use of two; in fact, F. J. Mortimer is reputed to frequently use half a dozen or so, one behind the other, obtaining "aerial perspective" in his seascapes by putting his birds in front of his waves, his clouds behind them, and so on.

The local control in the actual enlargement of the negative is obviously at least as great as in bromide enlarging. Portions of the negative can be shaded by a moving card during exposure; and similarly, additional illumination can be given to other portions. As this is the easiest way of making considerable areas generally lighter or darker in tone, it should be used whenever such a change is desired; and is particularly useful for subduing areas too strongly lit near the edges of the picture,—a very common condition in landscape work. Of course, to a less extent this sort of differential printing can be also employed in making the transparency from the small negative.

To a certain extent the enlarged negative must be produced with a view to suit whatever work is to be done on it. If, as is very frequently the case, it will be necessary to back it with tracing paper, the negative must be kept relatively thin, since such backing tends to yield a harder print. Furthermore, if the work on the paper is to take the form of lightening portions of the sky, the sky must not be developed heavily in the negative, and for the purpose of avoiding too great compression of the lower gradations an exposure of full duration to reduce the contrast between the sky and the darker parts of the picture (one which will, that is, compress the high tones somewhat) should be given, and develop-

ment should be short and soft. In those cases where compression of the higher tones by full exposure is inadvisable, e.g., where a generally brilliant effect is desired, the sky must be added to in the positive, or shaded down in making the enlarged negative. The enlarged negative, when finished, can be retouched on the surface in the usual way, to get rid of any small imperfections which may exist. It is usually best to take no notice at this stage of the small black spots which almost invariably appear in greater or less numbers; these can be easily spotted out in the print, whatever the printing process be. Irregular objects with well-defined borders can also be best removed by retouching on the film. Sometimes, though rarely, a little local reduction by a chemical method is advisable; for which purpose the reducing solution made up as follows has been found to work satisfactorily:

Saturated solution potassium permanganate.	$1\frac{1}{2}$ dr.
Concentrated sulphuric acid .....	$1\frac{1}{2}$ dr.
Water.....	10 oz.

The water is to be added to the permanganate solution, and then the acid. The strength is purposely low, so that the action can be kept well under control. The plate is kept wet, the reducer applied with a tuft of cotton, or, where small, defined areas are to be reduced, by a small brush, the plate being frequently washed with water during the progress of reduction. Conversely, if a small area only needs lightening in tone, a thin wash of grey lantern-slide tinting color is often the easiest thing to use. For extensive and varied alterations of relative tone values, working on the back of the negative is the most usual and useful method. Translucent paper, which should not have too strong a grain, and which will take a pencil easily, is gummed to the glass side

35-50A

by a thin stripe of gum at the edges. If slightly damped previously, it will contract on drying and give a perfectly smooth surface for work. Some beautifully translucent papers turn yellow irregularly, in the course of time, and these should be avoided. Fine work can be done by pencil-ing, broad work by means of a stump and crayon. The separation from the print by the thickness of the glass softens off the edges of work a little, but to take advantage of this, and to prevent slight crudenesses in the work showing, it is of course advisable to print in diffused light. The extent and variety of the modifications which can be made by work on the back of the negative can be best gathered by experience. It is easy to emphasize a sky which only appears in the negative as a suggestion; to work in the most diverse types of sky illumination and their appropriate reflections; to make the general scheme of illumination of a flatly lit subject change to one in accordance with almost any desired plan; to introduce accents of light, varying from the strongest to delicate suggestions; and to emphasize any minor lighting effects that may support the general composition or idea. Not only so, but it is equally easy to remove undesirable dark objects, such as fences, telegraph poles, portions of buildings and so on; and if the general focal character of the picture is not one of extreme sharpness, very little skill will produce a result in which no trace of these removals can be seen. It is also possible to darken portions of the picture by painting the tracing paper backing in such places with Canada balsam solution, thus making it more trans-lucent; but this is a method not very easy to apply with complete success, and as the same end can be gained in most printing processes by "painting in" and with special ease and success in the carbon process (or even by the use of the etching knife on the surface of the film), it is better to leave

these modifications to be dealt with in that manner. It must be admitted that in work on the back of the negative one is in a sense working "blind" and that a trial print will usually indicate the need of some alteration of the work as regards depth of deposit applied; this is, however, easily adjusted.

### THE NECESSITY OF TRUTH

We have above referred to the uselessness of interference which is undertaken without a definite idea for the improvement of expression. We must point out, however, that it is equally common to meet with cases where interference has been carried out without a proper consideration for truth. No doubt a certain amount of "poetic license" is allowable and indeed necessary, but absolute, palpable contradiction of necessary fact should at all cost be avoided. The mere development of a lighting scheme which has been obtained in the original negative is a fairly safe proceeding, but when we come to the very useful and sometimes necessary procedure of grafting on to a picture a lighting scheme of a different nature from that under which the negative was taken, we have to be very wide awake to avoid the danger of mutual contradiction. Such an instance as recently came before us in a portfolio, a flatly printed bromide entitled "A Grey Day," the first glance at which showed a brilliant and obvious sunshine on the principal figure and foreground, is a rather extreme type of the sort of thing to which we refer. Still, it is possible to be too captious in these matters. The "truth" of an effect is not always a matter to be settled by logic, and if an effect looks right, it *is* right. No matter, on the other hand, how scientifically correct a photograph may be, if it looks bad, it is artistically *untrue*. Observation of nature, and fidelity to your observation in your work, will

enable you to avoid at any rate the worst forms of inconsistency. A curious case of criticism based on faulty observation relates to the print "Jersey Lowlands," reproduced on page 17. The criticism was leveled against this print that the sun did not appear to cast a shadow. This looks plausible to any one who has never taken the trouble to closely and thoroughly observe what things actually do look like when the sun is setting and is on the horizon. Those who have, know that at such times the lighting is flat, and that no perceptible shadow whatever is cast by the sun.

As practical illustrations of the applications of the methods we have been discussing, the following notes on various prints illustrating this volume, may serve (though not all of these prints are landscape) to indicate, to any who may be unfamiliar with the extent to which these methods may be used, their fields of usefulness in landscape work. It will be particularly noticed that practically all the prints show manipulated skies, for, as every practiced worker knows, the rarity of success in obtaining a negative under such conditions that the sky harmonizes in feeling and in composition with the rest of the subject makes this procedure frequently an absolute necessity. The annotated prints contain, however, alterations in many other important respects, as will be seen.

"Jersey Lowlands." Page 17. A fence and some telegraph wires taken out, and the sky put in, on the back of the enlarged negative. The sky effect was drawn from an actual sunset.

"Twilight." Page 27. The lights in the sky introduced, and the soft sunlight between the trees added, by work on the back of the enlarged negative. The bottom of the print darkened by shading remainder during part of printing.

"Evening." Page 23. The "trees" visible in the dis-

tance were created at the expense of a hill, which occupied the distance in the original negative. This has been cut up into the distance as shown, which is, to say the least, more interesting. Sky and counter-reflection in water have also been worked in. All done on back of enlarged negatives.

“The Albright Gallery.” Page 25. Sky illumination and emphasis of the curve of the approach worked in, in the same manner.

“On Eighteen Mile Creek.” Page 21. Sky worked up, distant hills softened down, and water modified to suit sky.

“An Italian Landscape.” Page 29. Railroad switch signal and line of rails removed and sky “sunned down” from left-hand top corner.

“The Road to the Shore.” Page 31. Sky darkened in enlarging, and light added on back. Corresponding light on road got by washing out in developing the print.

“A Summer Day.” Page 55. Sky illumination and reflection added, and middle distance softened down, on back of enlarged negative. Foreground darkened in printing.

“Winter.” Page 51. Snow in bottom left corner shaded down a little in enlarging negative. Ripples in right bottom corner emphasized a little by brushwork on print in developing.

“Moonlight.” Page 53. Small portion of original negative only used. Vessel trimmed so as to cut off upper part of sails, sof, flat enlarged negative made and sky, moon, reflections and light on boat added on back of negative.

“The Silver Stream.” Page 49. Light in sky added, and light on snow slightly emphasized. The ripples in this print were produced by throwing in a stone a second or two before exposure.

“The Rising Wind.” Page 57. Sky effect added, and waves emphasized by work on both positive and enlarged negative.

“Trees of Lombardy.” Page 59. Probably the nearest approach to a straight print ever produced by its maker! Shadow of tree somewhat darkened.

“Where the Iris Grows.” Page 61. Straight.

“A Winter Landscape.” Page 63. The original was made on a clear day which gave distance as dark as foreground. Distance lightened in tone, and surface of frozen snow in foreground diversified by work on back of enlarged negative.

“The Mission Tower.” Page 81. Sky darkened and light on dome emphasized on negative, columns lightened by brush on print.

“Indian Summer.” Page 83. Originally sharp, hard negative. Sky entirely manufactured, trees and distance on right softened by manipulation on positive and enlarged negative. Bottom corners darkened in printing positive.

## CHAPTER VI

### CARBON AND OTHER PRINTING PROCESSES



LONG experience has shown us that most photographers neglect the carbon process in a way which always has surprised us, and continues to do so. Convinced as we are, to such an extent that it seems almost foolish to us to argue the point, that the carbon process is by far the best all-round process for the pictorialist, and especially for the adequate expression of the landscape pictorialist's ideas, we are nevertheless confronted with the fact that few pictorial workers of today use the process at all, and that its use in landscape work is, if anything, even rarer than in other branches of photography. Assuming for the moment — what we hope to be able below to give good reasons for — the correctness of the opinions above expressed, we ask ourselves what reasons there may be for the condition of affairs just described. Upon a careful analysis, it would appear that this condition is largely caused by widespread misconceptions of the difficulties and possibilities of the carbon process. These, at any rate, so widely are they held amongst amateurs, ought to be corrected; and though we have nothing to say about the process which is new — most of it, indeed, is so old that it appears to be widely overlooked or forgotten — a discussion of the question may lead, we hope, to an extension of interest on the part of American landscape workers in a process which is at once one of the oldest, quite the most

flexible, and in our opinion the most expressive (in landscape, at all events) of all the printing processes of the present day.

#### CARBON AN EASY PROCESS

In the first place, there is the idea that the carbon process is a "difficult" process. In the second place, there is the impression, widely prevailing amongst pictorialists of experience and ability, that the process is susceptible of modification to but a very limited degree, a view expressed, for instance, by Mr. Walter Zimmermann in a lecture before the Franklin Institute quoted in *American Photography* for February, 1909. Thirdly, there is a very general ignorance of the flexibility, richness of expression, and scope of the process. Finally, the process is, as has been already stated, old; and consequently lacks the spurious charm of up-to-date-ness which appeals more to many workers than the beauty of results.

The usual accounts of the 'carbon process manipulation, with their formidable array of heating stoves, thermometers, temporary supports, and so on, are, it must be admitted, somewhat alarming; but the complexities of second transfer do not come into the question, since the single transfer process is not only all that is necessary in landscape work (or enlarged work of whatever description), but is, on account of the greater choice of support and greater ease of preparing the latter, preferable; and the manipulation resolves itself, as we will attempt to show in our next chapter, into the simplest of operations, requiring neither elaborate apparatus nor more than very ordinary skill. What it does require is the expenditure of a little time, and the possession of some patience; and it is perhaps on this account, as not lending itself readily to the production of a number of prints in a short time, that it has acquired its reputation for difficulty among those whose aim is quantity rather than quality.

The actual simplicity and ease of the operations are well emphasized in Thomas Illingworth's little book, "Carbon Printing Made Easy," which is in all ways the best and most instructive treatise on the subject for the beginner. Any-one desirous of making a few prints of excellent quality, rather than a number of indifferent prints, will find the truth of Illingworth's remark that, with the exception of the blue-print process, the carbon process is the *easiest* printing process in existence.

The question of the extent of modification possible brings the process into comparison with the more newly developed gum process, and the very recent oil and bromoil. Unquestionably carbon does not possess to such an extent as these latter processes the capacity for modification in printing. But a very important question is germane to this issue — how much modification is it advisable to be able to do in the *print*? There seems to be a tendency today to look only at the modification which is possible in the actual development or pigmenting of the print. This attitude is surely as reactionary in its way as that taken up by the "straight" school. After all, duplicates of one's pictures are sometimes desired; and difficult as it sometimes is to repeat the exact quality of a carbon print, the exact reduplication of a gum or oil as to quality and modification is a task verging on the impossible. Manual modification in the development of a gum print or the pigmenting of an oil print offers the allurement of watching the picture grow under your hand, of correcting this, subduing or emphasizing that; it is all (if you have acquired sufficient skill) so very easy. But this very ease, this almost irresponsible power of making an alteration at a stroke, as it were, has its dangers. It really gives us little or no greater power of modification than we possess, for instance, by taking full advantage of the methods described

in our last chapter, and similar ones. It is just as possible and at least as easy to lighten a spot or area by work on the back of an enlarged negative as by "hopping" it off in the oil print; and if we have to concede that there is in the brush action of the oil process a power of diversifying the texture as well as the tone values which is unique, it still remains true that for the majority of desired alterations it is merely a question of the deliberation by which such alterations are carried out in the older methods against the facility offered by the new. This very facility has its drawbacks; if we set the practical impossibility of exactly duplicating a print by the newer methods against the undoubted convenience of being able to see as one goes along exactly what the effect of the interference is, there still remains the danger that the ease of overdoing the thing will lead to the thing being, precisely, overdone.

A recent inspection of some oil prints by one of the most prominent exponents of the process has convinced us of the existence of this danger, at any rate; and though overdoing the thing is by no means uncommon by the older and more deliberate methods, it is at least one's own fault in the latter case, done deliberately and with either ignorance or malice aforethought, and not, as appeared to be distinctly the case in the examples to which we allude, the result of an irresistible temptation due to seeing a certain striking but horribly "untrue" effect grow under the hand. All this is, we admit, a digression; but we hold it as questionable whether all modification should not be done as deliberately as possible, and as far as possible in the stages before printing.

#### POSSIBILITIES OF MODIFICATION

To return to the extent to which carbon offers the power of modification in printing, the idea that its scope in this

direction was extremely limited would seem to have operated in the direction of preventing photographers from attempting its modification. Certainly the fact that a strip of the same tissue as is used for the print can be dissolved in hot water, and the resulting mixture of pigment and gelatine solution painted while still warm on the print, giving a deposit indistinguishable from the original deposit, makes it possible to darken a tone, to paint in a spot or a large area, and to carry out any alteration involving addition of pigment to an extent limited only by the skill of the operator. Local development by restricting the area on which the developing water is poured after the removal of the unacted-on tissue in the first part of the development, and the use of a soft brush (or, even, in stubborn cases, the cautious use of a fairly hard one), serve to lighten considerable areas or small accented spots respectively. Certainly, while in no way approaching the newer processes as regards the ease of modification by a touch, as it were, the carbon process offers at any rate sufficient field for the more subtle changes, which, assuming that the grosser forms of modification have been taken advantage of in the earlier steps, is about all that we need require of it.

We accompany this chapter with a print (Page 114) from an untouched negative, and a gum print (Page 115) from the same negative in which unusually free advantage has been taken of the power of modification in development of the print. Such sweeping changes could, of course, scarcely be carried out in carbon, though there would be no impossibility in making most of the changes in earlier stages, and the remainder in a carbon print. It should further be emphasized that such modification of the print as is possible in carbon (and it will be noted from what has been said above that this is far more considerable than is generally admitted) is much easier to

carry out successfully, demanding in the one case less skill of touch, and involving in the other less danger of ruining the print, than corresponding work in oil and gum respectively. This is no small advantage.

From the pictorial point of view pure and simple, all such considerations as we have been discussing above are of really minor importance, and the critical and important question is that of the degree and range of expression possible. This, of course, will vary for each individual worker; that is to say, different workers will find different media more suitable for their work than any other. To discuss the character of expression possessed by other printing processes would take us too far afield. We will therefore confine ourselves to the discussion of the particular pictorial characteristics of the carbon process.

#### ADVANTAGES OF CARBON

Starting with a feature which is usually not mentioned in this connection, let us claim first that a good carbon print possesses, quite apart from the presence or absence of any pictorial value in the picture, the property of "looking good" to a greater extent than a good print in any other process. The richness of tone, the absolute continuity of deposit, the depth of unchoked shadow,—in short, all the factors which are summed up in the phrase "carbon quality,"—combine to give a pleasant and uniquely decorative appearance. Some of the most "expressive" processes gain their character at the expense of decorative beauty of tone, texture and surface; their appeal having consequently something of the violence of an—*aesthetic*—kick; and this unrestfulness becomes the more insistent the more one becomes acquainted with such pictures. If the better sensuous appearance of a carbon print is no positive feature of particular aesthetic merit, at least it is so negatively, standing

as it does for the absence of certain objectionable qualities, and permitting the quiet, undisturbed enjoyment of the picture. Indirectly, indeed, this innate quality is of great positive value, particularly to the landscapist; for to it he owes in no small measure the unique power which carbon has of permitting the presentation of the picture in such a way that the superficialities, if one may call them so, instead of being at best passive and at worst a disturbing factor, actually fit in with the mood of the picture and assist in the formation of a completely harmonious aesthetic whole. For the landscapist who deals chiefly in "moods," this peculiar richness of carbon is an added powerful weapon to his armory; for the one who works chiefly on decorative lines there is the enhancement of the decorative value of his work, in the broad sense of the word. For our own part, this rich and harmonious quality of carbon is something we value highly, and it is the combination of intrinsic decorative beauty and of assistance in presenting character thereby afforded, that has, more than any other factor, determined our use, almost exclusively, of this process. It is difficult to define the quality to which we have been referring more closely; but the apparently inevitable loss, to a much greater extent than other printing processes suffer, of the intimate and subtle character of the best carbon prints in photomechanical reproduction is at once an indication of the nature of that character and its importance, and a proof that carbon possesses that character in a quite unique degree. More than in any other branch of pictorial photography, landscape work depends for its success on the transmission of a certain *mood* or sentiment of the subject, as seen by the photographer; or upon purely decorative effect; in either of which cases the property of carbon described above becomes of extreme importance.

As regards the physical factors bearing on the scope of expression, such as surface, range of useful gradation, and color, no single process can begin to compare with carbon. The acquisition of a deep knowledge of the effect of these factors on the print forms an almost inexhaustible study; and the proper use of technique so acquired, to the end of obtaining a print of the utmost character and expressiveness possible, forms an art in itself. In all respects the choice is wide; in some respects almost unlimited; and the field offers to those of an experimental turn of mind opportunity for constant research, the results of which are certain to be of great value in their pictorial work. Without going closely into the effect of changes of these factors (the only useful knowledge of which is, as often, that which each worker digs out for himself by personal trial), we may briefly indicate their scope.

For the support of the picture almost any surface can be used. Pretty nearly everything, from Japanese tissue to a door-mat, has been used. As usual, extremes are only curiosities, and the pictorialist will find ample choice of surface and texture afforded by drawing papers and such charcoal and similar papers as will resist the action of hot-water development. There is here an almost unlimited series of surfaces, from the smoothest to the roughest, and a pleasant variety in "grain." The choice so offered should be taken full advantage of, boldness of result naturally being assisted by the rougher papers, delicacy by the smoother, and so on. Nor need one restrict one's self to white surfaces; in fact, either by the use of tinted papers, or by tinting white papers either before sizing with a water-color wash, or adding water color to the first coat of size, almost any sort of tinted surface may be employed, the more delicate of which can be used, by carefully harmonizing with the color of the tissue em-



SUMMER AFTERNOON  
*Oscar C. Anthony*



PRINT FROM AN UNTouched NEGATIVE  
*G. Edwin Keller*



FINISHED PRINT FROM THE SAME NEGATIVE  
*G. Edwin Keller*





THE SHORE ROAD  
*G. Edwin Keller*





AN IRISH GENTLEMAN  
*F. Austin Lidbury*





MORNING

*G. Edwin Keller*





PASSING IN REVIEW

*W. H. Porterfield*





MENACE  
*F. Austin Lidbury*





AN ITALIAN GARDEN  
*Edward B. Sides*



ployed, to obtain a richness of effect scarcely to be approached in any other way. Of course color combinations of this sort must be controlled by a delicate color taste!

### RANGE OF GRADATION

Probably the most generally admitted fact about the carbon process is that it has an almost unsurpassed range of useful gradation. Certainly in no process is it easier to get a rich, transparent, unclogged series of the very low tones, and at this end of the scale a beginner can hardly fail. It is not so easy to treat successfully subjects in the lighter tones alone, this demanding some little experience in the selection of a suitable tissue, the proper adjustment of the quality of the negative, and practical exactness of exposure. The latter may be said, however, of almost all processes, and with the knowledge that comes from experience the worker finds open to him, by a proper choice of factors, a scale of useful gradation exceeding in its extent all other processes, and offering a quality in any particular part of the scale equal to those processes usually supposed to exhibit that part to the best advantage, and a quality in the extended scale which is unapproached. In the versatility of carbon in this respect lie at once its strength and danger.

Different tissues are suitable particularly to certain portions of the scale of tones; some are unsuitable for work in other portions; and a few seem to give equally characteristic and beautiful results in any and every portion. It is very difficult, for instance, to get a satisfactory result in a picture composed entirely of light tones in the colder blacks (platino, engraving, or blue black), and for the desired result a cold grey must usually be resorted to. On the other hand, the warmer blacks will, without exception, give a fine result entirely in high tones, with a little care as to exposure. One

of the most striking differences between tissues of different tint is the tendency of some to give soft, and of others to give hard prints. That at once offers a choice of quality in the prints from a given negative, and at the same time demands, if prints in a certain tissue *and* of a certain quality are desired, that the negative shall be made of such a quality as will fit the peculiarity of the tissue.

Italian green is, for instance, one of the softest working tissues, probably *the* softest working; and at the same time there is no tissue better capable of giving a highly brilliant result, with heavy shadows which yet show every gradation of the thinnest parts of the negative, with lights losing no trace of detail, but showing a charming softness of tone, and with half tones of the utmost brilliance and gradation. But to obtain a print in this tissue which shall take advantage of its extraordinary range to the full demands a negative "as hard as nails," one with clear shadows but very dense high lights, one, in fact, which would be of no use whatever for any other printing process, or even for any other tissue. On the other hand, this same tissue can yield, with an average negative, beautifully soft prints unsurpassable for a certain type of subject. To take another widely different tissue, brown black has a certain tendency to softness at the ends of the scale, giving prints in light or dark tones with the greatest subtlety of gradation, but tending to separate rather violently the extremes of the scale in the case of brilliant subjects, and consequently being particularly suitable for quiet, soft work of not too extended range of tone.

Every single tissue has its characteristics of this nature, and the knowledge of these characteristics forms the basis of success in carbon printing. Without going into the matter in detail (for to attempt to describe in a few words the peculiarities of each tissue would only result in giving a very

imperfect and probably incorrect idea of them), it may be said that not only is there usually a wide choice of tissues of different tints in which the same *tonal* effect can be usually secured, but there is also the power of obtaining quite different tonal effects from the same negative by the use of different tissues, as was emphasized in a letter by one of us published in *American Photography* (see Appendix A, page 175). These differences are not altogether, or even principally, a matter of color, but depend apparently chiefly on the different opacities, in the same portion of the scale, of different tissues. Indeed, it is possible to obtain prints in tissues of which the colors, if not close, are of practically the same psychological significance, which will possess quite a different "mood," owing to the divergence of tonal properties. It is no uncommon thing, familiar as we are with the peculiarities of the tissues we commonly use, for us to try two or more tissues of nearly related tendencies in working, in order to be sure that we are getting the tonal effect most nearly striking the "mood" which it is desired to present; and it is sometimes astonishing what variations in the degree of approximation to this effect small differences in the working qualities of the different tissues will bring about. This wide field, open to all who are not so mentally constituted as to be content with the first print that looks passable, is obviously of enormous importance in squeezing out the last drop of meaning from a landscape subject.

#### POSSIBILITIES OF VARIOUS COLORED TISSUES

Nor, particularly as regards landscapes, are we of the opinion that the sheer psychological effect of the color of the print is of negligible importance; and we most emphatically disbelieve that this factor should not be taken full advantage of. As an example, we have in mind a snow

picture in light and medium tones (no deep tones) which, it was found, gave an excellent tonal rendering, practically identical as regards the opacity of the tones, in either a cold grey or the warm brown black, that is, a panchromatic reproduction of either print would have failed to differentiate between the two as regards feeling. Between the prints themselves, however, there was the world of difference that the grey print insisted on the chilliness, the uncompromising barenness of the scene, which was, precisely, what it was desired to insist on; the brown print, on the other hand, sheerly on account of the color, took on an effect of attempted softness, as though the landscape were trying to masquerade in a garb of warmth, with the result that a general impression of invertebrate weakness was given to the print. Cases where the color of a picture may either harmonize with and assist, or contradict and destroy the feeling and idea of a landscape photograph, are, though rarely to such an extent as this, very common indeed; and the relative warmth and coldness, brilliance and quietness, of the colors which can be employed is thus still another factor which can be taken advantage of in the attempt to leave undone nothing which can enhance the expressiveness of the picture. As regards the choice of tints open, every maker of tissues has an imposing list, most of which, unfortunately, are so crude in tone as to be, for the purpose in hand, unusable. There are, furthermore, distinct gaps which ought to be filled up; the most noticeable of which is the absence of a *neutral* grey. The tints obtainable, however, form no mean selection, among the most useful of which are, for landscape work, brown black and the almost if not quite identical transparency black, blue black, grey, Italian green, and less frequently warm black, standard brown, engraving black, cool sepia, sea green, dark blue, and some others. We refer to the Autotype

tissues, having little experience of others, with the exception of the grey, which is Barnet, — a most useful tissue, but, on account of the large amount of pigment, a difficult one to handle on account of its tendency to crack. These tints may not be the most useful in other makers' lists, and the same holds, of course, for the Ozobrome tissues.

As regards transfer papers, we unhesitatingly advise the worker to prepare his own. The method of doing so will be described in the next chapter, on the manipulation of carbon, and, if a little tedious, is very easy. The purchased transfer papers are machine coated, and take on, apparently owing to the thickness of the sizing coat, a very objectionable quality of surface, while the home-sized papers retain the beauty of surface of the original drawing or other paper used. For most work of 11 x 14 size, Whatman's medium may be taken as standard, and varied according to the demands of the subject in hand by the rough, cold pressed or similar papers. For special surface effects the grain of Michallet or Lalanne (the latter being beautifully tough) and similar papers are frequently useful.

We have said enough, we hope, to indicate the extraordinary diversity of effect which the carbon process, on account of the extent to which the factors which we have been discussing can be varied, permits. That this diversity of effect is of enormous value in obtaining prints of the maximum possible richness of expression is obvious; and while it is of course true that the style of some workers is better suited by other printing processes, and that occasionally one will have a subject to handle which is best fitted by the characteristics of, say, platinum or gum, there is no other process which in so many cases offers the precise means of saying, with all the assistance that the quality of print can give, exactly what you have to say. The very variety

of the process, however, makes it necessary that the choice of conditions shall be controlled by an intimate knowledge of their effects, and this involves, of course, a period of experimental apprenticeship. So, however, does success in any particular branch of photographic technique, and we hope we have made it clear that there is no printing process which will so readily and richly repay the work undertaken in acquiring a thorough knowledge of its scope as the carbon process. In the next chapter we describe shortly the methods of working with carbon; and while we cannot add anything to the knowledge of those who employ the process already, we hope to show those who are personally unacquainted with it that its chief manipulative characteristic is simplicity.

## CHAPTER VII

### CARBON PRINTING



AKING a carbon print involves the steps which will be briefly described in this chapter. Summarized, they are as follows: a piece of "tissue" — a gelatine film in which a considerable amount of fine pigment is incorporated, coated on paper — is sensitized in a bichromate solution, and, on drying, exposed under a negative. In proportion to the amount of light passed by the various parts of the negative, the surface of the pigmented film is rendered relatively insoluble to various depths; consequently, when the tissue is again moistened and placed in contact with a piece of paper of a surface so prepared that the pigmented film will adhere to it, immersion in warm water will permit the original paper backing of the tissue to be removed, and the unacted-on tissue washed away, leaving the insolubilized pigmented film on the prepared paper in the form of a positive of full gradation. This is known as the "single-transfer" process. A moment's consideration will show that the prints so obtained are reversed, but this is of no consequence in pictorial landscape work, and in other cases the enlarged negative may be made reversed by placing the positive with the film toward the light in the enlarging lantern.

#### PREPARATION OF THE TRANSFER PAPER

The transfer paper is to form the support for the pigment and gelatine which will constitute the image, and, as we

showed in our last chapter, its surface qualities are an important factor in the appearance of the finished picture. Transfer papers can be purchased in a variety of surfaces, but the shiny, thick layer of size with which they are provided destroys practically all the beauty and character of the original papers, and gives to the print a highly objectionable gloss. He who buys prepared paper because he is too lazy to prepare his own need not expect to get out of the carbon process anything like the full beauty of result which it can give. Any paper which will stand prolonged soaking in hot water can be easily used. It is convenient to purchase sheets of the standard size 22 x 30 inches, which cuts into four pieces 11 x 15 inches. This is none too wide for an 11 x 14 inch print, since it is necessary that the transfer paper be at any rate slightly larger all round than the tissue, but as a matter of fact, by using the tissue a shade under eleven inches wide, and taking advantage of the fact that the paper is usually a fraction of an inch wider than the nominal 22-inch, no trouble will be experienced. The preparation of the paper merely consists in giving it, according to its surface, two or more coats of size. Smooth papers will not require more than two coats; medium will need three; rough, four or even more. To make the size, soak 1 dram of Nelson's No. 11 Photographic Gelatine in four ounces of water, and ultimately dissolve by placing the containing vessel in boiling water. When completely dissolved and thoroughly heated, add, drop by drop, with constant stirring, one-fourth ounce of a ten per cent solution of chrome alum. The size is kept in the boiling water and used while still hot. It should not jelly, and will not do so if the above instructions have been carefully observed; but though the books tell you that size which jellies is of no use, our experience is to the contrary, that if sufficiently rubbed into the paper it acts just as well.

The size is best applied with a small sponge, and — this is important — well rubbed into the paper. The object is to get, not a thick coating, but several thin ones well worked into the surface. For this purpose a little time and energy are necessary, and rubbing should be carried on quite vigorously, care being taken, of course, not to use more force than the surface of the paper will stand. It is convenient to make a number of pieces of transfer paper at once, the unsized side being marked to prevent mistakes later. As each paper is sized, it may be placed on a warm surface (such as the top of a stove, covered with paper) to dry; and when all the papers have received their first coat, the first will be ready for a repetition. It is perhaps better to let the last coat dry without heating.

Blisters, shiny spots, and staining of the whites of the print by the pigment, as well as other defects, are due to imperfect or insufficient sizing. It requires very little experience with papers to determine how many coats any particular paper needs, and with this knowledge a worker has only himself to blame for any troubles he afterwards experiences in this respect. Such troubles are naturally to be more frequently met with in the rougher papers, but if a proportionately generous number of coats is given they ought to be entirely absent.

#### SENSITIZING THE TISSUE

A very convenient method of keeping tissue is to cut the roll when bought in two pieces 15 inches wide; one inch is then cut from each (the outside strip). This gives two rolls of 14-inch width, and two 1-inch strips which can be used for providing pigmented gelatine for spotting and painting in. The rolls can be easily and neatly cut to these sizes on a band saw. It is, of course, advisable to pencil on the paper of the

tissue the name of its color. From these 14-inch rolls it is a very simple matter to unroll and cut off lengths of eleven inches as required for use. It must be noted that one should at no stage finger the gelatine surface of the tissue, or marks may result. If the tissue is difficult to unroll, and shows a tendency to crack, it is advisable to place the roll in a closed box with a damp sponge or damp blotting paper (keeping the roll, of course, away from direct contact with these) for a day or so. Of course, tissue may also be purchased ready cut.

The sensitizing solution consists of

A

Potassium bichromate .....	2 ounces
Water .....	64 ounces

A better and easier solution to use is as follows:

B

Potassium bichromate .....	2 ounces
Citric acid .....	$\frac{1}{2}$ ounce
Dissolve in water .....	30 ounces

To this add strong ammonia water sufficient to change the orange color of the bichromate to a lemon yellow.

When sufficient ammonia has been added, the solution will retain a strong smell of that substance.

Then add

Water to make .....	64 ounces
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On occasions stronger or weaker sensitizing baths may be used. We advise, however, the exclusive use of the formula B above. For those who may occasionally wish to affect the nature of the print by variations of the sensitizing solution, it may be said that increasing the strength of the

bichromate makes the tissue more rapid, and decreases contrast in the print. The use of ammonia and citric acid, on the contrary, slows the tissue and increases contrast in proportion to the amount of citric acid present. To flatten contrasts a ten per cent bichromate solution without citric acid or ammonia may be used; to increase them, a solution containing half the bichromate and twice the citric acid given in formula B. The presence of the ammonium citrate in the bath gives a tissue which can be used two weeks after sensitizing; the straight bichromate bath gives tissue which rapidly spoils unless kept out of contact with air and under pressure. Much ammonium citrate makes the high light detail tend to wash away. The normal period of immersion is two and one-half minutes. Increasing the time of immersion makes the tissue more rapid and tends to flatness in the print; decreasing the time of immersion has the opposite effect. These notes are given for those occasions when modification of the contrasts in printing is desired, but it is better to get the negative of the proper quality and to use formula B for a definite time of immersion. The estimation of the proper printing time becomes easy when the same conditions are always observed, otherwise it is very difficult. The degree of printing also affects the contrasts, so that even without variation of the method of sensitizing these can be considerably modified, overprinting with correspondingly protracted and drastic washing-off in development tending to flatness of result, slight under-printing with very cautious development with relatively cool water tending to greater contrast.

To sensitize, a piece of cut tissue is placed in a bath of the sensitizing solution in a relatively deep dish (we usually use enameled baking dishes for all 11 x 14 inch negative and print work; they answer admirably and are cheap),

and unrolled as rapidly as possible. It is necessary that the surfaces, both front and back, should be covered as nearly instantly as possible, and to this end, if the tissue does not immediately unroll, it is unrolled from one end to the other, under the bath, until it begins to flatten out, when it is carefully and rapidly brushed over on both sides with a soft, flat brush, to remove any air bells which may still adhere. After flattening out it is kept moving in the bath until two and one-half minutes have elapsed from the commencement of immersion, then removed, holding two adjacent corners, allowed to drain somewhat, then placed face downwards on a clean piece of plate glass, and the surplus solution removed by half a dozen gentle but firm strokes of a squeegee in the same direction. (The squeegee for this purpose must be at least twelve inches long, so that the whole of the tissue is covered at each stroke; it should also be of soft, pliable rubber. No photographic squeegee on the market is properly suitable, but it has been found that the cheap rubber squeegees sold at half a dollar or less at the rubber stores for cleaning windows are admirable for the purpose.) The tissue is then carefully lifted from the glass and pinned up by two corners to dry in the dark. The removal of surplus solution as described permits the drying of tissue in the hottest weather without melting. The sensitizing solution should be used at about 65 degrees Fahr. in summer, and 65 to 70 degrees Fahr. in winter. It may be used for months or until badly discolored, if kept in the dark or if filtered after use. If not exposed to the action of the products of combustion of gas, etc., and if carefully protected from damp and light (all of which conditions are easily fulfilled by keeping in a closed box or drawer in the dark-room), the sensitized tissue will be usable for a period of two weeks, if the citrate bath has been employed. Its speed, and flatness of result, increase

with keeping. Tissue sensitized without citrate rapidly becomes unusable unless kept in pressure boxes with a desiccating agent.

### PRINTING

The printing only differs from the printing of other papers in that a "safe-edge" must be employed, and in that the exposure must be determined by a consideration of conditions, since there is no visible image. The "safe-edge" is formed by a strip of passe-partout paper pasted on the glass side of the negative, and covering, say, one-fourth inch from each edge. Its object is to protect the edges of the tissue from the action of light, as otherwise the edges of the transferred image would tend to wash up from the transfer paper during development. Exposure is best judged from experience, though more or less complex actinometric methods are in use, and can be resolved into testing by means of Solio paper. A small piece of this, with a corner doubled over to permit of comparison, is exposed under the highest light of the negative. The time necessary to give the paper a slight but distinct tint will be about the right time (in the same light) for tissue sensitized in bath A, and one-quarter to one-eighth of the right time for tissue sensitized in bath B, according to the "age" of the tissue and the quality of the negative. It must also be borne in mind that the printing continues after the removal of the frame from light, and if development is to be carried out immediately more exposure must be given than if development is to be postponed until evening. Further, there is the "pictorial factor" to be considered here as in exposing a negative, since we are not necessarily requiring a normal technical print, but may want one with a much lower or much higher scale of tones, and the exposure must be fixed accordingly. On the whole, it is

advisable to choose one sensitizing bath, always to sensitize under the same conditions, always to print at approximately the same distance of time after sensitizing (e.g., next day), and to develop either always directly after printing or at about the same length of time afterwards. Working thus under comparable conditions the judgment of approximate exposure from the conditions of light and the nature of the negative becomes a matter of experience, and, since a considerable amount of latitude is given in development, failures in exposure become rare.

Before printing, the piece of transfer paper on which the print is to be placed is soaked in water, of a temperature not lower than 65 degrees and not over 75 degrees Fahr. The object of this soaking is to swell the gelatine sizing and bring it into proper condition for the transfer. The duration of the soaking varies, with the thickness and roughness of the paper, from fifteen minutes to one hour, but oversoaking does no damage. Into the same bath of water, at the end of the time, is brought the print; both sides of this are rapidly wet all over (beware of partial wetting, which causes streaks in the print), brushed over with a soft brush to remove air bells, and turned face down over the transfer paper, which lies sized face up. The bath is rocked until the tissue gets properly limp and straightens out. Then, taking care that no brush hairs, bits of fluff or paper, or air bells remain between tissue and transfer paper, they are brought together, so that an edge of transfer paper projects beyond the tissue edge on all sides, grasped with thumb and two fingers of each hand on the near edge, brought over the edge of the dish, and laid on the plate-glass sheet used in sensitizing, tissue above the transfer paper. Holding the two in contact at one edge, the squeegee is used to press out superfluous moisture with a few rapid, but not rough, strokes. The transfer

paper, with the now adhering tissue, is placed in a copying press between boards, several sheets of hard blotting paper being placed between boards and print, and firmly squeezed down. A large copying press, taking boards about 12 x 15 inches, is almost a necessity for successful carbon work, particularly with home-sized rough papers, but workers of an inventive turn of mind could easily improvise other and cheaper, though less convenient means of applying an even, heavy pressure to the two boards, such as an arrangement of clamps. The time during which the prints should be left in the press varies; fifteen minutes will be sufficient in most cases, but rough transfer papers not infrequently require half an hour or longer. At the expiration of this period the print is removed, clipped to a sheet of glass (a spoiled 11 x 14 inch negative with the film removed) by two small "bull-dog" clips, tissue side up, and plunged into the developing bath.

#### DEVELOPMENT

The developing bath is merely warm water, at about 100 degrees Fahr. One gets the habit of hitting the proper temperature by the "feel." Care must be taken here, as everywhere in the carbon process, that the whole of the print is covered as nearly instantly as possible. After rocking in this bath from twenty to thirty seconds, the pigment will be seen to begin to ooze out at the edges of the tissue, the paper backing of which is then taken by one corner and gently and *evenly* pulled off. Here again care must be taken that the water follows the tissue backing immediately, covering the pigment as fast as it is exposed by the removal of the backing, or as soon as possible after. After soaking for about a minute (during which time, and by the introduction of the cold glass and print, the water will have cooled somewhat), development is begun. The glass, with the print

attached, is held out of the bath at an angle, and a small cup used to lave the surface of the print with the warm water of the bath. At first the untanned gelatine-pigment mixture rolls off, and the laving is so conducted that this is removed as evenly and completely as possible. By this time the water will be relatively cool, and the appearance of the now exposed image will indicate how the remainder of the development should be conducted. It must be borne in mind that the print on drying will appear darker and less brilliant than when wet. If, therefore, at this stage the print appears slightly lighter than is desired, it has been somewhat undertimed, and care must be used in any local development employed, since the film will be very tender and sensitive. Should no local development be necessary, the print is merely taken out and, after draining, set on blotting paper or hung up to dry. A properly exposed print will show about the right density after washing away the very soft tissue, but this will require somewhat more development in order to give the desired appearance on drying. Hot water is therefore added to the bath (the print being removed) until a temperature of 100 degrees Fahr. is again reached, the print immersed, and by continued soaking and laving more and more of the film is dissolved away until the appearance is slightly lighter than is desired. The procedure in the case of an overexposed print will vary with the degree of overexposure, and it is to be pointed out that while a very badly timed print is of no use whatever, more can be done with a relatively badly overtimed print than with an undertimed one, the latter, if more than slightly overtimed, losing all lighter tones at the commencement of development. Overtimed prints can be treated either by hotter water, by the addition of alkalies to the water, by friction, or by a combination of these agents, and while the results are in no case



TWILIGHT'S MYSTERY  
*W. H. Porterfield*





AFTER THE SHOWER  
*W. H. Porterfield*



THE FALLS  
*Edward B. Sides*



THE MAID OF THE MIST

*W. H. Porterfield*





**NIGHT**

*W. H. Porterfield*





THE RAPIDS  
*Charles Booz*





SUNSHINE  
*G. Edwin Keller*





THE STATE NORMAL SCHOOL, BUFFALO  
*W. H. Porterfield*





PINES

*Photo Pictorialists of Buffalo*



so brilliant as those from properly timed prints, much can be done by the judicious use of alkalies on an only moderately overexposed print, and in the extreme cases where friction is used, a granular, "gummy" effect, not unpleasant for certain subjects, can be obtained. The incautious forcing of development by the means referred to may easily result in the blistering of the print, and this places a limit to their employment. A well-adhering print can, however, *gradually* be brought with safety to as high a temperature as can be comfortably employed, and by continued soaking and laving can be considerably reduced in density. Such treatment results at the same time in a flattening of the gradations, since the veiling of the higher tones persists very strongly. In extreme cases a soft, broad brush may be used to rub over the surface, or the surface may be worked on with the fingers, care being taken, of course, not to detach the film, which even when strongly tanned is very tender. Or after drying the print can be resoaked and the film reduced locally or generally with sapolio applied by the fingers. These latter are all heroic methods, and the result is, as has been said, "gummy" and granular, except in the majority of cases, when the result is simply a spoiled print.

There is a distinction between the action of hotter water and the action of ammonia on the print which is of considerable importance, but has not, as far as we know, ever been pointed out. If a slightly overtimed print be developed by the prolonged action of hot water there occurs a flattening of effect due to the relatively greater action of the hot water on the heavy deposits of pigmented gelatine and its relatively insignificant action on the slighter deposits in the lighter tones. Hot water acts thus in a manner analogous to the persulphate negative reducer. Ammonia, on the other hand, seems to take equal amounts of pigmented gelatine from all

tones, and its use consequently leads to a brightening of a print flattened by overexposure. It is thus analogous to the hypo-ferricyanide negative reducer. The useful practical consequence of this is that such a print can be brought, by the cautious use of ammonia in the developer, into a state of brilliance almost indistinguishable from that of a perfectly exposed print. When it is seen that a print is slightly flatter than is desired, owing to the heaviness of the higher tones, instead of using hotter and hotter water to continue the development, a teaspoonful of hot ammonia water may be added to the bath, and development continued. It is astonishing what a far-reaching effect quite small quantities of ammonia will produce, and one's tendency is rather to put too much ammonia in at a time. On the other hand, hotter water is the best developer for a print which, though somewhat too dark, has not lost its brilliance through overprinting, and also for a print in which an essentially soft effect is desired.

After all, what one aims at and ought to get (within the necessary limit) is a proper exposure for the result desired. Such an exposure demands a development in moderately warm water for a moderate time, and makes it easier to carry out any necessary local modifications. Broad areas may be lightened by carrying out the last portion of development by laving only, without immersion, and restricting the flow of the water to those parts of the print which it is desired to lighten. This is a slow job, and patience is necessary. Local spots may be lightened by the use of soft brushes; these can be used without much precaution where the layer of pigment is thick, but in delicate lightening of portions of light tone, where the layer is thin, great care is necessary. In the latter case a very gentle stippling action acts better and is far less likely to show that work has been done than

the regular sliding brush action. It is better to do such work halfway through the development, and somewhat exaggerate the effect; the completion of development will then remove the exaggeration and obliterate any evidence of crude handling. Surprising changes can be made in the lighter tones by these means, and the ease of delicately modifying the high tones constitutes an advantage of no low order. On the other hand, little impression can be made on the deeper deposits, except with hard brushes, sapolio, or alkalies, the use of which is likely to bring the whole film away, and it is best to modify one's shadows on the negative. As in other matters, so in the modification of carbon prints, a little practice will show what can easily be done, and what can only be done with difficulty and care.

After development, local and general, the print is washed in cold water, and may then be treated to a five per cent alum bath, after which it is rinsed and dried. The alum bath is not necessary, and it may well be omitted in any case until the print is dry, when, if development has not removed all trace of yellow bichromate stain, it may be resorted to. There are some tissues in which a trace of bichromate stain left on the paper helps the effect, giving a slight warm tint to the whites; so that the alum bath may be omitted unless the stain gives an objectionable appearance to the print.

When the print is just not dry, any areas or spots may be painted in or darkened. The work is easier and smoother before the film dries completely, but it can be done at a later stage, even after the print is mounted. Some of the same tissue is dissolved in a small quantity of hot water, and, keeping the solution hot, it is easy to paint it over any spots or areas that appear to need darkening. A little practice will show that modification to an astonishing degree is pos-

sible in this direction, and, the pigment being the same as that constituting the picture, and being applied in the same medium (gelatine), it is impossible, if the work has been carefully done, to notice it, even on close examination. The one leading principle in "painting in" is not to attempt to put much pigment on at one application. Much smoother and more even results are obtained, in places where a heavy coat is necessary, by applying a thin layer several times, allowing the previous coat to dry to the setting point before applying the next. There is no analogy in oil printing to the ease with which detailed modification by addition of pigment can be employed in carbon, and though gum prints can be painted in in the same way the results in that process are not so easy to conceal. As we stated in our last chapter, the amount of modification by addition which carbon permits is only limited by the skill of the worker, and for the more frequent modifications (toning down unnecessarily distracting spots) success does not demand even ordinary manual dexterity.

As stated above, "painting in" can be resorted to after the print is mounted, and as inspection at leisure often reveals some minor details which can thus be assisted, this often comes in useful. One other detail of modification after mounting ought to be alluded to, viz.: the brightening up of the lights by the use of an india-rubber eraser. There is frequently an accent of light or an area such as the lightest spots in the conformation of clouds which proves, on drying and mounting, to be slightly veiled. In these cases the brilliance of the print can often be materially improved by gently rubbing off some of the thin deposit at such points by a fairly hard eraser. This very simple procedure sometimes results in an astonishing improvement of effect. Should the surface of the print show the result of such work, it is easily restored

to normal by sponging over with a wet sponge, after which the interference is not to be detected. We have seen one of our members improve the luminosity of the light accents of his pictures by this method on the actual walls of an exhibition!

## CHAPTER VIII

### THE PRESENTATION OF THE PRINT



So to mounting and framing, it is wisest to steer a middle course. The object aimed at should be to provide the print with a suitable and harmonious setting, which will show it to advantage, but not attempt to compete, even to the least degree, in interest.

*Positively*, the mount must exhibit good taste and also show a proper conception of the fitness of things; for it is possible to mount any print in two totally dissimilar ways, both of which may harmonize perfectly well with the print, both of which may show excellent choice of combining tones and colors, and yet one of which will totally destroy the idea, the mood, the message of the picture, while the other will, in no small degree, contribute to its support. There is therefore the necessity, not only of selecting a tasteful mount, but of trying various combinations which fulfil this condition, in order to discover which will best help to support the basic idea of the picture.

*Negatively*, the mount must not be in the least degree insistent; and it must be carefully borne in mind that insistence does not depend so much upon the violence of the mount — indeed, there are cases where a violent mount is required, and, when used, does not appear violent — as upon failure to hide the fact that care has been taken to “show off” the print, from casual view. In no operation has the

maxim, "*Ars est celare artem*" more direct and important application. The simpler the means used to completely accomplish the end, the less is the danger, in mounting and framing, of overdoing, of adding just the little extra touch which gives you away. Multiple mounting is a very useful procedure; but it may be taken as true that whereas the usefulness of multiple mounts reaches a maximum very rapidly (in our opinion, at two mounts), its dangers, both that of inharmonious effect and that of insistence, increase as the square of the number of mounts used. On the principle that the farther we go away from home, to take an "awful illustration," the less likelihood there is of broken heads as a result, we would like to refer to a print by Mr. F. H. Evans which we once saw. We take an English example with the more readiness because our English photographic friends have the habit of referring to the use of a whole pad of superposed mounting papers as "the American method of mounting"; why, we do not know, except on the principle that to label a thing "American" is, with some of them, the most convenient and quite the politest way of damning it. Mr. Evans is known to the whole photographic world as a painstaking and tasteful photographer, of cathedral subjects chiefly; and we suppose this print we saw must have been one of his delicate platinotypes of cathedral architecture. We say we suppose so, because our attention was so taken up with the beautiful assortment of papers (four or five of various widths and of charmingly harmonizing creams and grays) which surrounded his print, and with the strikingly designed monogram embossed on the mount, that we really forgot to look at the photograph itself. Now, Mr. Evans is one of the few photographers with the sharpness of taste which permits the selection of completely satisfying combinations of several superposed mounting papers of various

widths and tones; and yet that mount would have completely drowned a photographic conception of far greater strength and originality than anything Mr. Evans has yet given to the world. Here was an unmistakable demand of the observer that he admire, not the print, whatever that was, but the mounting, executed with such loving care; and of course the observer had no choice but to obey.

The proper presentation of the print thus offers only a narrow channel between Scylla and Charybdis; and it is therefore small wonder that there are periodic revolts against any sort of mount whatsoever, and a tendency to close-framing. Apart, however, from the difficulty arising out of the fact that the frame now assumes more importance and must consequently be treated on the same principles as we have outlined for mounting (a not by any means easier matter), close-framing is really only advisable for prints which are to be hung under such conditions that they can be shown to advantage by a proper arrangement of their surroundings, and made to fit in well with their environment, as, for example, at home. As regards work for exhibition, there is no point in discussing the relative merits of close-framing and mounting; except in very rare cases, where the omission of the mount helps by giving an additional effect of "bigness" to a subject treated very broadly, the mount is, for exhibition work, far preferable. In the first place, it helps a print in its competition for attention; in the second place — and this is really the important matter — it separates the print from adjacent prints and provides a harmonious and effective ground for it. How much a print can lose by the *close* position of another of a contradictory effect, and how much of this loss can be prevented by the mere space and tasteful background provided by a proper mount, any photographer who has had to do with "hanging" an exhibition knows.

Accepting the mount, then, as more or less a necessity, it is impossible to formulate rules for satisfactory results. As already indicated, it is largely a matter of trying different papers until a satisfactory result has been reached; and by a satisfactory result is meant one which assists the print to convey its intended effect. It is well not to be too afraid of conventionality in mounting and framing. The less it is necessary for you to overstep the bounds of ordinary practice in such matters, the less is the danger of the mount attracting more attention than the print. The proper place for the exercise of originality is in the selection of the picture, and in the work which intervenes between this and the finishing of the print; anywhere and everywhere but in the selection of mounts and frames! Misplaced ingenuity in evolving startling or elaborate schemes of presentation is a poor substitute for originality of conception or of effect in the print; and if the latter qualities be also present, the effect of a competition for the observer's eye between print and mount will not assist them by any means.

As the gradual result of trial and comparison we have ourselves adopted as our standard practice, usually followed except for some good reason, the simplest form of double mounting, consisting of a main mount and a relatively narrow insert, usually varying from  $\frac{1}{4}$  to  $\frac{1}{2}$  inch in width, around the print. We have been convinced by abundant experience that an exhibition gains immensely by homogeneity of mounting, and we see no advantage equivalent to this to gain by variations which we might otherwise adopt in the method of mounting. We find, on the contrary, that such limitations as the method imposes lie almost entirely in the difficulty of obtaining papers of certain tints, and are consequently common to all methods. Often the best method is to select

some paper for the main mount which is of a tone more or less neutral, both as regards depth and tint, to the print, and to select for the insert a paper which, while never clashing with the main mount or print, is so chosen as to bring out, like a touch of sauce, the tonal characteristics of the print. Of course this rule, such as it is, has nothing like general application, but is often departed from. The narrow insert, however, certainly affords the opportunity of adding a little, unobtrusive touch which seldom fails, if properly applied, to greatly intensify the general effect.

Cover papers of various kinds form the chief material of selection, and the photographer will do well to be supplied with a very wide variety of the most useful and least objectionable tints. It is impossible to have too varied a supply; a few dollars will purchase a couple of hundred sheets, and the more assorted these are, the more likely is the worker to be able to pick out just the right shade for his print. Trials are conducted by laying the trimmed print on a sheet of the paper selected for the trial mount, with the trial insert provided by another sheet of paper so placed that only a thin edge projects on two edges of the print, giving, as far as these two edges are concerned, a pretty accurate idea of how the whole combination will appear. A long fund of patience has sometimes to be drawn upon before anything quite satisfactory is found. Sometimes one finishes with the conviction that the whole thing would be much better with paper of a tint which is not at hand. Particularly is this likely to be the case when mounting prints on some of the richer dark brown tissues, for example, "transparency black"; frequently these seem to call for a cool, very dark brown mounting paper which doesn't, apparently, exist as an article of regular commerce. At all events, such a paper has yet eluded our persistent search. Greyish browns, of a yellowish cast, are

common enough; so indeed are the lighter browns of a pleasantly cool tone; but a rich dark brown cover paper, really cool in tone, would fill a serious gap. Practically all of the darker brown papers of this type are of such a crude, warm reddish tone that after a heartbreaking hour or so spent in attempting to find something that will "fit" the rich, cool quietness of the better carbon browns, one frequently turns to cold greys as the next best thing, and contents oneself with a mount that, while harmonizing well, falls somewhat short of what it should be. This particular range of tint is, however, about the only one in which such a hiatus exists; in other cases one will find no difficulty, provided one has a reasonable selection of papers to experiment with, in arranging a suitable combination; in fact the point for consideration will usually be, which of several combinations is the best.

As regards the operation of mounting prints of the size 11 x 14, a few hints may be useful. Use a stiff pulpboard, and begin by pasting the main mounting paper on one side, and a similar piece of paper on the other. This will assist in preventing curvature of the mount when dry. (Ordinary stiff flour paste is the cheapest mountant, and as suitable as any; one small advantage of carbon prints is that one does not have to be continually on guard against the introduction of noxious chemical agencies through mounting papers or paste.) The now covered board is placed under pressure by covering it with a similar piece of board and placing one's copying press on the latter, and the print is now mounted on the insert paper, allowing a wider edge on the latter than will be needed. The insert is then trimmed down to the required width (usually, of course, it will be left wider at the bottom). This method of procedure has two advantages: firstly, it avoids the difficulty of properly centering the print

on the not much longer insert and the bad effect resulting from the smallest deviation from accurate centering; secondly, it allows of the accurate parallelism of the edges of print and insert, and avoids the unsightly effect due to slight but often unavoidable deviation from exact rectangular form in trimming print and insert separately. Finally, the insert to which the print is now fixed is pasted in the selected position on the main mount. It is advisable, in mounting carbon prints, to cover the print with a fluffless blotter when applying pressure, rubbing or squeegeeing, the surface being tender when damp through permeation of the print by the moisture of the mountant. When satisfactory adherence has been secured, the print is covered with fluffless blotting paper, a piece of pulpboard at least as large as the mount placed on top, and the whole left under pressure (e.g., by putting the copying press on) for half an hour or so, after which it is removed and allowed to dry completely.

Framing a picture so mounted deserves a word or two; the best frame for the purpose is a narrow one of the simplest possible pattern, and of a tint which agrees well with mount and picture. As a rule the frame should be somewhat darker than the mount, and similar in tint. It need not be stated that an easy way to get a picture framed wrong is to leave it to the framer's mercy without either selecting the frame molding or giving explicit and definite instructions regarding it. Even at best you are liable to have difficulties, as the framer always knows what is good for your picture a great deal better than you do, and unless carefully watched, is liable to act accordingly!

And now we must bring these chapters to a close. Our object in writing them has in no way been to offer anything novel or unknown; it has rather been, firstly, to attempt to

stimulate interest in a branch of pictorial photography of which the really serious pursuit is too much neglected; and, secondly, to assist comparatively inexperienced aspirants to successful work in that branch by pointing out the principles and methods which, as experience has taught us, afford the readiest means of attaining or approximating to the results aimed at with the minimum of technical difficulty and manipulative complexity, and so to save them some of the enormous waste of energy which nearly every pictorialist must have to look back on as characterizing his earlier attempts to master his medium. It has been very encouraging to us to learn, both directly and indirectly, that we have met with some success as regards the second of the objects stated; and we hope that our exhortations will also not have been without success in inducing some of our readers to cultivate the serious study of landscape work. The best work in landscape photography is still to be done; the field is open to every photographer, wherever he may be. Our own pictures have been drawn almost entirely from a neighborhood of about as little natural beauty as can be conceived, a region in which even our favorite working spots are anything but the parades of well-laid-out poplars which some of our distant friends credit them with being. Our pictures, such as they are, are the result of long search, often year-long work on the same subjects, and constant endeavor to produce a picture rather than a photograph of a beautiful spot. To the worker with persistence, and a steady endeavor to keep in view merely the picture that is to result and not the view as his eye sees it by a casual glance, success is usually possible. The first steps will be taken in that direction when he ceases to take pleasure in mere technical proficiency, and begins to recognize when a photograph is simply a photograph and nothing more. If then he is able to grasp and

act on the idea that the camera is a tool to his hand and not a master to be slavishly followed, he is on the road. If, finally, he judges all his work by the standard of expression of character and beauty, he is on the right road, and we wish him good luck.

## APPENDIX A

### THE COLOR OF THE PRINT

F. A. LIDBURY



DITORIAL COMMENT" in *American Photography*, under the heading of "The Color of the Print," expressed some views which are so superficially plausible, but at the same time so misleading, that I trust you will allow me to present to your readers the other side of the case.

In the first place the proposition that photography is distinctly a monochromatic process may be readily admitted; but the deduction therefrom of the further proposition, that *heretofore* "every successful print must produce its effect without the aid of color," involves a distinct *non sequitur*. "Monochromatic" means "in one color," but it does not imply any particular color, either black, brown or any other. In monochromatic work the choice of color employed is entirely within the discretion of the worker, and he is justified in taking any advantages that may be afforded by the particular color he chooses. The result, and the result alone, furnishes justification or lack of justification for the choice of color employed, as in the case of the selection of any other factor which contributes to the result. This brings me to your next remark, that "prints of equivalent values should be equally effective in any color." I am tempted to ask you to print a snow scene in a warm, brown tone to convince yourself of one error contained in this dictum. But, apart from that, it is unfortunately the case that prints "of equiva-

lent values" cannot be obtained "in any color." This is particularly well known to workers in the carbon process, in which the range of color employed is much greater than in the so-called chemical printing processes. Tissues of different colors have widely different scales of useful gradation. They differ again very widely in suitability for prints of different quality, some being particularly suitable for soft, others for bold results. Even those which fall into the same classes from the above points of view differ in their behavior in certain portions of the scale of gradation; thus, for instance, Italian green and warm sepia would both be classed as "soft working," yet the former possesses a depth and solidity in heavy shadows which are entirely absent in the latter. It will be obvious from this, and any experienced carbon worker will substantiate the fact, that prints of "equivalent values" cannot possibly be obtained in different colors. The mere change in color of the deposit is always sufficient to change considerably the equivalent values of the tones, as far, at any rate, as the eye is concerned. The experienced pictorial worker, knowing this, naturally and properly selects for his print that color whose idiosyncrasies best lend themselves to the effect desired, as regards tone values in different parts of the scale of gradation. Carbon offers in this respect a freedom equaled by no other process; and though it is unfortunately true that in some cases the full range of expression of the print is apt to be lost in mechanical reproduction, this does not seem to me to afford any justification for the suggestion that the photographer should limit his range of tone effect, and consequently the expressiveness of his print.

Your further objection that it is artistically wrong to endeavor "to give the impression of natural color" rests upon an entire misconception of the reasons upon which the



MOONRISE

*W. H. Porterfield*





TOWARD EVENING  
*W. H. Porterfield*





THE STORM WIND

*W. H. Porterfield*





BROWN STONE AND IVY  
*W. H. Porterfield*





THE CATARACT OF NIAGARA  
*W. H. Porterfield*





NEAR THE ROYCROFT, EAST AURORA  
*W. H. Porterfield*





AS IN THE DAYS OF PLATO  
*W. H. Porterfield*





THE GORGE BELOW THE WHIRLPOOL, NIAGARA  
*W. H. Porterfield*



selection of a particular color for a particular print is based. These are two-fold. In the first place, as stated above, the characteristics of the tone range of different tissues can be taken advantage of.

In the second place, the character of the print often depends largely upon the choice of color, and this independently of any idea, which I admit you might justly censure, of copying natural color. If the essential character of a pictorial photograph is to be defined I do not think it can be done better than by describing it as richness of expression. Any element which can enhance this richly expressive quality improves the pictorial value of a photograph. Now, even in monochrome, the shade employed is a decided element in expression. Some colors, including most of the browns, add a feeling of warmth to a print, which is the converse of the coldness of effect produced by those blacks and grays in which blue forms a preponderating element. Green, again, has a brilliance of its own which contrasts strongly with the rich, dark depth of certain brownish blacks. It consequently frequently happens that the character of a color itself may be made use of to enhance the effect of a print with the general idea of which it is in keeping. A winter scene may, for instance, have its effectiveness considerably increased by the cheerlessness of a cold, bluish gray print; or it may happen that a certain quality of evening mystery and depth can be conveyed fully only by the use of a soft, full dark brown; or we may find again that a desired scintillating effect of sunlight, with soft, luminous and unchoked shadows, demands the brilliance of a soft, light green for its sympathetic and complete presentation. Where in such cases is the attempt to give the impression of natural color? There is nothing of the sort; these are legitimate uses of the aesthetic effect of color to contribute to the desired result,—a print of rich expressiveness.

Finally, it seems to me that the use of different colors merely "for variety" is both purposeless and reprehensible, and that the logical outcome of the view you express would be the restriction of photographic prints to pure black and white, and the condemnation of all processes such as toning, all pigment processes except when neutral black pigment is employed, all silver prints, and so on over about ninety per cent of the range of printing technique. If you do not object to the use of color indiscriminately employed, why object to its use for a definite aesthetic purpose?

## APPENDIX B

### THE ADVANTAGES OF SMALL GROUPS OF WORKERS



Some time ago, The Photo-Pictorialists of Buffalo came into existence about 1907. It consisted of eight members, and had as its aim the cultivation of photography as a means of expression. Its constitution was of the simplest, there being no officers except a correspondent, each member taking an equal interest in the organization; and there were no regular dues, expenses being defrayed by a whip-around when necessary. During its existence it experienced some changes in membership, but it was always characterized by enthusiasm and unremitting pursuit of the object for which it was formed. Its now considerable experience of the working of a somewhat uncommon type of photographic organization well qualifies its spokesman to enumerate the advantages which its members enjoy.

It must be clearly understood that in pointing out the advantages of small organizations of photographic workers, we do not wish to reflect in any way upon the usefulness of the photographic society or camera club of the usual type. The latter has a very large and diversified field of usefulness, which it fills with almost uniform success; and since the average amateur photographer's interest in his subject is rather extended and general than specialized and intimate, this must necessarily remain so. Organizations of small

groups of advanced workers in individual fields of photography have, however, advantages so pronounced that it is very surprising that so few of them exist. We are convinced that they fill a need which the larger and more heterogeneous club does not fill, and that photography would gain immensely by an increase in their number. Our own organization, as its name implies, was formed for the pursuit of pictorial photography; but small groups of workers in any other special branch of photographic work would undoubtedly find advantages quite as great, if somewhat different in nature. We shall confine ourselves, however, to the consideration of small groups of pictorial workers.

To such workers technique is only a means to an end; and progress in pictorial work connotes a limitation in the number and variety of processes employed; connotes, also, an intensive study of all the range of which those processes are capable. To the pictorialist it is less important to have a smattering of knowledge of a multitude of printing processes than to have a thorough knowledge of all the capacities for diverse effect of one or two; less important to have a knowledge of a dozen different plates than to know how to produce all the different results of which one plate is capable; less important to have a "fine" lens than to know how to use whatever lens he has, poor or fine; in short, the technique he requires involves a highly specialized knowledge of a few chosen photographic media and of a few phases of photographic work. Such specialization is acquired not by listening to discourses on numerous elementary photographic subjects, but by assiduous experimental study. Here the small group gains heavily. No time or effort is lost in the pursuit of technical processes whose interest lies merely in the fact that they form another way of doing "the same thing." The homogeneity of interest insures that technical

efforts are confined to attempts to realize desired effects, and the combined experience of a group whose activities are confined to pictorial work rarely fails when called upon by a member for advice as to the procedure necessary to produce a certain desired result. Both technically and in all other respects the knowledge and advice of the whole group are always mutually available, for there is an entire absence of that competitive spirit which tends to secretiveness. Every member's work comes before the club in all stages. First rough prints from the original negative pass around; are pronounced promising or otherwise; suggestions for treatment are discussed; opinions differ, and healthy debate follows. The value of this procedure needs no comment, but a somewhat curious result has been that occasionally it happens that a negative destined by its too modest producer to destruction has been preserved and worked up at the instigation of other members, and has ultimately yielded a successful and much admired result. The first prints from the enlarged (and where necessary, worked-up) negatives are also submitted for criticism, and duly receive it. Recommendations are made as to changes in printing medium, in tone values, even (dare one confess it?) changes in line, the removal of this feature, the strengthening or subdual of that, and so on. It happens with surprising frequency that practical unanimity on such points develops. The victim is at liberty to take such of the advice as he considers good and neglect the rest; the result almost invariably being that when the final print is produced for inspection it is found to have gained vastly in beauty, harmony and expressiveness.

It may be said that mutual advice and criticism are features of all photographic organizations. Theoretically this is true, but our practical experience is to the effect that in the usual cases these features are severely limited. Several circum-

stances combine to bring this about. In the first place, the extent and variety of the interests of different members of the usual type of society make it impossible to apply the touchstone of mutual criticism thoroughly or consistently, since a standard which is proper in one line of work becomes absurd when applied to another. In other words, what is true in pictorial photography is, for example, eminently false in reference to high-speed work, and vice versa. Promiscuity of interest is usually fatal to specialized success, principally because lower standards are almost inevitably associated with the former. The unfortunate truth is that though large organizations usually include men capable of excellent work in their own chosen lines, it is the "man in the back row," and not these, who virtually sets the standard. Criticism, as a result, is usually perfunctory and on "book" lines. In the next place, the competitive element is too often destructive of the spirit of mutual assistance. If the chief object of a member's work is the gain of awards at his society's annual exhibition, as it too often is, secrecy as to his work somewhat mistakenly, but nevertheless surely, follows. Under such circumstances members first see one another's work at the exhibition itself. Thirdly, the personal relations of members of large groups can never be such as to permit of that entire freedom of critical utterance without danger of being misunderstood or of exciting resentment, which is possible under the relations which come to exist between members of a small group.

We have gone rather closely into the matter of mutual advice and criticism because our experience is that this feature in our own organization has been of inestimable value to every member, and has resulted in a general leveling up of the standard of work produced. What American pictorial photography emphatically needs more than anything else is

the application of high standards of criticism; and this can be best brought about by the association in groups of workers on common lines for the deliberate purpose of cultivating higher standards, and for mutual assistance in attaining these.

One result of close association in work, of mutual openness, and of the fact that most of our work is done for joint exhibition, is that the prints of our members show a certain unity of style and harmony of effect which has been commented on frequently. This does not imply that it could be supposed that the prints of different members were the work of the same man. The retention and development of individuality is our highest aim and that it is not sacrificed in our efforts to so present our work that it may be harmoniously exhibited together is shown by the fact that we never have to ask who is the producer of a print set before us. It bears on its face sufficient information to tell the rest of us "who saw it that way." Nor, working as we usually do, with our cameras constantly at the same spots and in company with one another, is there liable to be the least similarity in the negatives which result. This, by the way, to show that harmonious presentation of the results of a number of different workers is possible without sacrificing individuality. That this object, one of vital importance from the exhibition point of view, is cultivated so little by most photographic organizations is regrettable. Probably it is due to causes already outlined, and, if so, constitutes another point in which the advantage is enjoyed only by the small group.

Finally, and perhaps of most importance, the causes which lead to the formation of such groups themselves imply very considerable benefits. The only bond of such an organization is the enthusiasm of its members, and the very continuation of its existence depends upon their work and progress. Membership, therefore, implies responsibility and assiduity

in the pursuit of its aims. It takes enthusiasm, belief in its ideals, and persistence in work to keep such a group alive. Consequently, no one lacking these attributes would ever think of joining such a group; and no one losing them, of remaining in it. It follows that each member is active, an enthusiast, in sympathy with the work of his fellow members and a worker. The mutual benefits enjoyed by members when membership necessarily implies the possession of these qualities are of an order not to be attained in any other form of organization, and our experience leads us to believe that a considerable increase in the number of such small groups of workers possessing a deep and mutual interest in one particular phase of photography could not but be highly advantageous both to the individual members and also to American photography itself.

## APPENDIX C

### MULTIPLE GUM PRINTING

PAUL LEWIS ANDERSON



OZENS of books and articles have been written on the gum-bichromate process, and many workers have tried it, only to abandon it after repeated failures, due, in the writer's opinion, to lack of standardized methods of working. It is undeniably easy to make a gum print of some sort, and this facility has led writers on the subject to advocate haphazard methods, many of them claiming "naiveté" and "spontaneity" in the results when these qualities are merely the result of chance, but the writer feels that technique in any medium should be as precise and exact as possible, the "spontaneity" being confined to the realm of thought and feeling. It is not meant that the technique should be hard and dry, but merely that it should be absolutely under the worker's control, so that he may do exactly what he wishes, thus expressing what he feels, rather than something which may have been the result either of chance or of a passing impulse.

In most writings on the subject of gum printing it is stated that the chief value of the process lies in the ease with which modifications may be made, either by brushing the print while wet or by painting on the dried print, and that the chief drawback is the impossibility of repeating a success, but the writer feels that this is far from the truth. No objection is raised to the local modification of values, but

this is less likely to be overdone if carried out on the negative, since few workers can resist the temptation, while developing a print, to lighten a value to see what it will look like, and still fewer have studied the question of values enough to recognize instantly what should be done. As regards duplicating a success, this is difficult in any medium, and the more sensitive a worker is, the more difficult it will be; but if exact methods of working are followed, it is as easy in gum as in any other medium. The writer feels that for the worker who aims at a few fine prints rather than many mediocre ones, gum is the perfect medium, its only defect being that long-scale prints are a little more difficult to produce than in platinum or bromide, though a single gum print is far easier to make than an oil, bromoil, or carbon, and a multiple print is only slightly more difficult to produce than the last-named, being easier than an oil or a bromoil. As for the advantages of gum, they are many. First, if the print be very slightly underexposed, so that the gum runs a trifle in drying, a vibrating effect is secured which is analogous to that given by painting in broken touches rather than in smooth strokes. Then, of course, the choice of color of the image, and color and texture of support, are practically unlimited — something which is true of no other process. These facts are true of both single and multiple prints; and, in considering the latter type, we find three additional qualities which are of inestimable value to the worker who cares for aesthetic merit. First, we can get a longer range of tones than is possible in any other medium. Second, we can get the characteristic quality of a photogravure; that is, rich, fat shadows without either gloss or muddiness. The third quality can best be understood by a comparison with painting. When a painter wishes to produce an effect of great richness and depth, he sometimes attains it by painting over and over his image

with successive layers of transparent pigments, thus giving an effect of looking through, instead of at, layer after layer of pigment, and this valuable quality, impossible of achievement in any single printing process, is very easily got in a multiple gum print.

It will be seen from the foregoing that for the worker who is willing to take pains and devote time to the production of a fine print, gum is the medium *par excellence*, though it is not advised for those whose aim is to make prints in large numbers.

The present essay is intended to do two things: First, to call the attention of photographers to the great value of multiple gum work; and, secondly, to point out a definite, precise technique which will enable the worker to accomplish results with certainty and exactness, though it is not claimed that any new principles will be set forth, rather a formulating of old ones which have been tried and found good. Since the technique of multiple gum is almost identical with that of single gum, an outline of the latter process will be given, and the variations for multiple work will be indicated as the description proceeds.

**THEORY OF GUM PRINTING.** — The theory of gum work is identical with that of carbon, and may be briefly stated thus: A layer of some colloid substance, having incorporated in it a pigment, is spread on a sheet of paper, being sensitized with a salt (the bichromate) of potassium, ammonium, or sodium. On exposure to light the salt is decomposed, the liberated portion acting on the colloid and rendering it insoluble in water to an extent depending on the amount of light action. Being treated with water, the soluble portions of the colloid dissolve and leave the paper, carrying with them their quota of pigment, the insoluble portions remaining behind, the pigment contained therein forming the image. In

practice, the carbon and the gum processes differ in several respects. In the former, gelatine is employed as the colloid, development being accomplished with hot water from the back of the layer, insolubilization, of course, taking place from the front. In the latter, gum arabic is used, and development is in cold water and is from the front. As a consequence, the gum process will render but a very short scale of tones, and multiple coating and printing must be resorted to in order to gain either a long scale or great depth of shadow.

**MATERIALS REQUIRED.** — Two graduates (16 ounce and 2 ounce); a mortar and pestle; some tubes of moist water-color; two brushes, one a flat hog's hair, rubber-set, the other a "flat fitch flowing brush" or a "badger blender"; gum arabic; arrowroot; mercury bichloride; four pushpins (thumb tacks are not so convenient); a flat board about two inches larger all round than the largest print to be coated; and paper on which to print.

The most useful pigments are ivory black, lamp black, Prussian blue, Venetian red, and chrome yellow, these giving cold and warm blacks (either transparent or opaque), together with a fine range of browns and greens. Either Devoe's, Winsor and Newton's, Favor-Ruhl's, or Talen's colors may be used, all being equally good. As regards the gum arabic, the granulated is the best. Any good drawing paper may be used, if it has a slight grain to the surface, very smooth paper being difficult to coat. The following are all good: "Griffon" detail paper (yellow), sold by E. G. Soltmann of New York City; "Strathmore Buff Detail," made by the Mittineague Paper Co. of Mittineague, Mass.; "Strathmore Charcoal" (preferable to the much-lauded Michallet); Whatman's extra rough (for large prints), and the "Strathmore" drawing papers. In fact, one cannot speak too highly of the papers put out by the Mittineague Paper Company. Unless

brushed roughly while wet, they will be found not to need sizing, even when multiple prints are made, something that is not true of Whatman's or of many other drawing papers.

**SIZING.** — Few papers will need sizing before the first printing, though this is advised if Whatman papers are used; but some will lose their size during the first development and require treatment before the second coating. This operation may be accomplished as follows: make up a medium thick, boiled paste of laundry starch or arrowroot, and, with a damp sponge, rub a fairly heavy coat of it (either hot or cold) well into the paper; or hard gelatine may be used, twenty grains being swelled in an ounce of cold water, dissolved by gentle heat, and applied in the same manner, but hot.

**THE NEGATIVE.** — Since gum is a short-scale process, it follows that, if we wish to render the full range of tones of the negative in one printing, we must use a negative of no great scale. For some reason that is unknown to the writer, a thin negative gives a better print than a dense one, even though the range of contrast may be the same in each case; and it is therefore an excellent plan to reduce the negative with Farmer's reducer as soon as fixation is complete, while the film is still saturated with hypo, and continue reduction until the lowest tones are clear glass. This also makes it easier to estimate the printing time. A negative which I consider typical proofs on Solio in one and a quarter minutes in clear midday sunlight in March. If a negative of this type is used, the full range of tones may be rendered in one printing, and additional printings will be necessary simply to increase the depth and richness of shadows and the contrast.

If, however, the negative be of too great a scale for this, the shadows may be printed in one operation, a thinner coating and deeper printing being used for the halftones, and a still lighter coating for the lights. The writer's preference

is for printing the halftones first, then the shadows, and the lights last; but this is purely a matter of personal choice, any order being perfectly satisfactory.

FORMULAS. —

STOCK GUM SOLUTION No. 1

Water.....	12 ounces
Gum arabic.....	2200 grains
Arrowroot.....	270 grains
Mercury bichloride.....	15 grains

To make this up, cut a piece of cheesecloth about a foot square, and hang it in a graduate or wide-mouth bottle so as to form a bag, the edges being turned down outside and secured by a cord or a rubber band around the top of the receptacle. Place the gum within this, arranging it so that the bottom of the bag hangs about three inches above the bottom of the graduate. Dissolve the mercury bichloride (which is a preservative, and is preferred to formaldehyde or carbolic acid because of its neutral reaction) in a portion of the water, grind the arrowroot to a thin cream in this water, add the remainder of the water, and pour through the gum into the graduate. Solution will take place within twenty-four hours if the gum be stirred occasionally. Various workers give formulas requiring the use of sugar, honey, glycerine, fish-glue, or several of these substances; but the formula given above seems to work satisfactorily, and has the merit of being simple. An alternative formula which is only slightly more difficult to make up and gives a little longer range of tones is as follows:

STOCK GUM SOLUTION No. 2

Water.....	12 ounces
Gum arabic.....	2200 grains
Water dextrine.....	270 grains
Mercury bichloride.....	15 grains

This is made up in exactly the same manner as No. 1, except that the mixture of dextrine, preservative, and water should be boiled until a clear solution results, before being mixed with the gum arabic.

#### STOCK SENSITIZER

Water (hot) . . . . .	15 ounces
Potassium bichromate . . . . .	720 grains

It is not necessary to use distilled water in making up either of these stock solutions, both of which keep well.

**COATING MIXTURES.** — If the negative is of proper quality for gum printing, the same coating mixture may be used for all the printings, and a formula follows:

#### TRANSPARENT SHADOW COATING

Gum solution . . . . .	$\frac{1}{2}$ ounce
Sensitizer . . . . .	$\frac{1}{2}$ ounce
Ivory black (from tube) . . . . .	4 inches

If warm blacks or browns are desired, a slight amount of Indian red, Venetian red, light red, or burnt sienna may be added, about one-eighth inch of Indian red being sufficient for warm blacks. The pigment should be put into a mortar, and thoroughly mixed with the gum (which is added a little at a time); then the sensitizer is added and well mixed in.

For a halftone coating the same mixture may be employed, except that half the amount of pigment should be used, while for a highlight coating the following mixture is advised:

#### HIGHLIGHT COATING

Gum solution . . . . .	$\frac{1}{2}$ ounce
Sensitizer . . . . .	5 drams
Ivory black . . . . .	1 inch
Red . . . . .	As above

If an opaque coating is desired lampblack should be used, the following formula being advised for a shadow coating:

OPAQUE SHADOW COATING

Gum solution.....	$\frac{1}{2}$ ounce
Sensitizer.....	$\frac{1}{2}$ ounce
Lampblack.....	1 ounce
Red.....	As above

This, of course, is not absolutely opaque, or only a silhouette would result, but by comparison with a print made with the formula in which ivory black is used, it appears much less transparent, and is therefore desirable as a first printing for a full-scale effect, or for a second or third printing to subdue shadow detail.

The proportions given in the preceding formulas may be regarded as normal, and, although considerable variation may be possible in regard to the gum and sensitizer, an excess of pigment over that advised for shadow coatings is liable to cause the coating to flake off in patches instead of developing smoothly.

If browns or reds are used, printing will take longer than for blacks, and, obviously, an opaque coating will print more slowly than a transparent one. Thus, if burnt umber is used, printing will take at least twice as long as with ivory black.

**COATING.** — Having prepared the coating mixture, a piece of paper somewhat larger than the negative, say an 11 x 14 sheet for an 8 x 10 print, is selected, pinned to a flat, horizontal board, and the mixture poured in a pool on the paper. (Four drams should be allowed for the first 11 x 14 sheet, three for the second, and two and a half for each subsequent one, since the spreading brush becomes filled.) The hog's hair brush is used to spread the mixture over the paper, which will stretch from the moisture, the slack being taken up by shifting the pins. The blender then comes into play, and the

manner of handling depends on whether the fitch or the badger blinder is used. If the former, the touch should be rather slow and firm, though gentle, and gradually growing lighter as the gum sets, nor should the motion be reversed. That is, a stroke from left to right should be followed by a contiguous one from left to right, not from right to left. With the badger blinder, brushing may be done back and forth, the touch being more rapid than with the fitch, and having a "whippy" character, gradually lightening, as in the former case. In blending, the gum is brushed crosswise of the paper, then lengthwise, to blend the streaks left at first, then crosswise again, and so on until the coating is perfectly smooth. Some practice is needed to learn the brush stroke, and to enable the worker to determine when to stop. As blending proceeds, it will be found, if the coating be closely watched, that as the streaks disappear the gum shows a tendency to run together in small puddles, which gradually disappear likewise, leaving a smooth surface. This is the time to stop blending, for if it be continued longer, streaks may result, though slight streakiness will smooth out in drying; and, even if some streaks are visible when the coating is dry, they will very likely disappear when the print is developed, or will be hidden by subsequent coatings.

When coating is complete, the paper is hung up to dry, and, if it is to be used immediately, drying may take place in an ordinary room, for it is not sensitive while wet; but if it is intended to store the paper for any time, it must be dried in the dark. This is due to the fact that if the paper be exposed to light, after it is dry the light-action will continue even though the paper be stored in darkness. Thus, if a print is correctly exposed under a negative and stored away instead of being developed immediately, it will be overprinted, while if exposed to faint light and stored, it

may be hopelessly fogged. Gum paper is at its best when perfectly fresh, but will work satisfactorily when several weeks old if kept in a sealed platinum tin with preservative. Brushes, graduates, etc., should be cleaned immediately after finishing the day's coating, for if the gum be allowed to dry on them it will be difficult to remove.

It will be found that, after several sheets have been coated, the blender will become clogged and refuse to work properly, when it may be cleaned by rinsing in water, and dried by rolling the handle between the hands.

Should blending be too long continued and streaks result, the print may be rapidly gone over with the blender, using a stippling instead of a brushing motion, following this by a very light brushing. Of course, if the streaks are too pronounced, the coating may be washed off without exposing, and the paper coated again when dry.

If more than one coating is to be given, it will be found advantageous to iron the dry print thoroughly before each of the additional coatings, since it will buckle slightly in drying and be difficult to coat smoothly unless so treated.

**PRINTING.** — If the negative be of proper quality, the printing time may be estimated by making a P.O.P. proof and printing the gum paper for the same time in the same light; while, if it is necessary to print for different portions of the scale, the same method may be used to determine the exposure for the several portions. If the printing is overdone, development may be forced by using hot water, a little alkali in the developing tray, or a brush; but the ideal exposure is that which will permit development to take place automatically in from half an hour to an hour, while if underprinted to such an extent as to develop in ten or fifteen minutes, the print may be thrown away, for it will surely run in drying. A very brief experience will teach the worker to

estimate visually the proper printing time for any given negative and coating

**DEVELOPMENT.** — If it is desired to retain the smooth gradations which characterize the drawing of the lens, development should be automatic; that is, the print should be taken from the frame, immersed, face up, in a tray of water at 60° F. to 75° F. until limp, then turned face down (care being taken that no air is imprisoned under it), the bubbles brushed off the back, and the paper allowed to remain, except for occasional examination, until fully developed, when it should be taken out, placed face up on a sheet of glass, and drained for about five minutes, then placed in a horizontal position to dry. If development does not take place within a reasonable length of time (one-half to one hour), the temperature of the water may be raised to about 120° F., or even more; but if this is done the paper should be sized before recoating.

If any of the values are to be lightened during development, the print should be turned face up in the tray after about ten minutes' soaking and development effected by allowing a stream of water from a hose or a graduate to fall on it, special emphasis being secured by letting the water fall from a greater height, so that it breaks and strikes in a succession of drops. Still greater emphasis may be got by brushing, under water, with a soft camels-hair brush, and more yet by removing the print from the water, placing it on a sheet of glass, and brushing without the protecting layer of water. For brush development, very soft brushes should be used, since there is thus less danger of getting a gritty texture, but a pointed sable brush may be employed for picking out small spots of light. When but little modification is needed, it may be better to allow development to be nearly finished, then lay the print on a sheet of glass, and stand it up, lightening the tones as required by means of a

spray of cold water from an atomizer, and returning the print to the tray for development to continue. The atomizer should be one of the type designed to spray a heavy liquid, such as the Albolene atomizer of McKesson and Robbins. A very little practice will make it possible to pick out fine spots by holding the atomizer close to, or to lighten broader areas by removing it farther from, the print.

If it is desired to darken portions of the print, this may be done after it is dry by mixing more coating solution, applying it with a brush, and, when dry, exposing to sunlight for a few minutes; then washing in water for half an hour. It is necessary to include the sensitizer and to expose to light, both to harden the gum and to insure a uniform tone, since there is sometimes a residual image from the reduced sensitizer.

If automatic development is employed, the bichromate stain will probably be removed during development; but if this is not the case, and it is desired to have pure highlights (a slight tone in the lights is often advantageous), the stain may be completely cleared out by a few minutes' treatment in a bath made up as follows:

Water.....	10 ounces
Sodium bisulphite (anhydrous).....	300 grains

This should not be employed until after the print is dry, as it has a tendency to soften the gum. The print should be rinsed in three or four changes of water after clearing. [Four per cent alum is often recommended, and hardens the coating. — Ed.]

**REGISTRATION.** — If multiple printing is employed, it is obvious that some steps must be taken to insure coincidence of the several images, and this may be done in any one of a number of ways. Some workers advise fastening the paper

to a sheet of zinc or glass, with dry-mounting tissue or insoluble paste, and securing register by crowding the negative and print always into the same corner of the frame; but this plan involves an unnecessary amount of work. An excellent method when printing from enlarged negatives is to make the negative on a piece of bromide paper or a plate which is larger than the portion to be printed, then lay the coated paper face down on the negative and make pencil marks on each edge of both. By taking care to have these marks coincide for successive printings, register is assured. When printing from negatives made direct in the camera, it is generally desired to utilize the whole of the negative, and the writer's plan is to use a sheet of paper somewhat larger than the negative, to locate the first printing approximately in the center; then, for subsequent printings, to lay the back of the printing frame on the table, place the coated paper face up thereon, make four radial pencil marks at the four corners of the printed area, and locate the corners of the negative by these marks, afterwards placing the frame in position and holding the back in while turning the frame over to set the springs. This, of course, involves the use of a printing frame a size larger than the negative, with a piece of glass the full size of the frame.

**GENERAL REMARKS.** — It will be seen that especial attention has been given to multiple printing, and this is because the writer feels that practice, together with automatic development, to be the greatest factor in making gum a valuable medium. Multiple printing is imperative in order to gain the full scale of tones and richness of shadows inherent in the process, and automatic development is almost imperative if the photographic quality is to be retained.

In connection with this matter of shadow richness, the writer wishes to comment on the method of gum printing

set forth by the late Mr. Walter Zimmerman in No. 113 of the *Photo Miniature*. Briefly, Mr. Zimmerman advised the use of just enough gum to take up the pigment, with five or six times this volume of sensitizer; development to be effected by letting the print remain in contact with a wet blotter. This method undeniably gives a print with a much longer scale of tones than can be got by one printing after the method outlined in the present article, but it loses utterly the quality in which gum printing surpasses platinum, or, in fact, any other process; namely, the fat shadow-quality which can come only from having several superimposed layers of pigment, each suspended in a thick layer of some transparent binder. That is, the quality depends not only on the amount of pigment deposited, nor only on the number of layers, but on the fact of each layer of pigment being suspended in such a manner that its thickness is greater than would be the case if the pigment were applied without a binder. In the method outlined herein the particles of pigment are suspended some distance from one another, while in Mr. Zimmerman's method they are closely compacted. The actual difference in fractions of an inch is infinitesimal — microscopic — but the difference in results is tremendous.

Another advantage in giving a number of printings with a comparatively large volume of gum in each coating is the soft definition which results. This softness is due partly to the loose texture of the gum, as compared with gelatine or collodion or with a platinum image, and partly to the fact that when development is automatic the insoluble gum swells and spreads slightly, thus softening the edges of sharply defined objects. If brush development be employed, the process of development is complete before the gum has swelled to any great extent; hence the definition is not so soft as in the other case.

Some softening of definition may also result from the fact that most papers if wetted and dried do not shrink to their original dimensions, so that it is necessary, instead of registering exactly, to "split the difference." If absolute registration is required, it is necessary to adopt one of three methods: Fasten the paper either to a metal plate with dry-mounting tissue, or to a glass or metal plate with insoluble paste; or, best of all, soak the paper thoroughly and dry it before coating for the first time. The writer uses none of these methods, but either "splits the difference" or, in case of a portrait, registers the face exactly and lets the remainder be out of register, the difference in dimensions between the first and the second image seldom amounting to more than one per cent of the dimensions of the print. On splitting the difference, we find that the lack of registration is hardly more than one-half of one per cent at each end of the print, or one-twentieth of an inch in an 8 x 10.

As regards the number of printings to be given, this will, of course, vary with each different result desired and with each different negative. It will be seen that a large number of printings with a small proportion of pigment in each will give a very rich quality with comparatively little darkness; while a small number, each containing a considerable amount of pigment, will give darkness, with a thin, hard quality. The writer has given as many as five coatings to one sheet of paper, but beyond this there is some danger of the gum's breaking loose when dry, unless glue be used in the coating mixtures.

If it is desired to duplicate results at a future date, development must be automatic and a record must be kept of the coating mixtures and time of printing. A convenient method of doing this is to file the negative in one of the

envelopes furnished for this purpose, writing the data on the outside, thus:

No. — 3467

Title. — Portrait, M. V. K.

Print. — Gum, three printings, same mixture for each.

Mixture. — Gum. ....  $\frac{1}{2}$  ounce

Sensitizer. ....  $\frac{1}{2}$  ounce

Ivory black. .... 4 inches

Indian red. ....  $\frac{1}{4}$  inch

Paper. — Strathmore charcoal.

Sun. — 15 seconds.

Time. —  $2\frac{3}{4}$  minutes.

The last two items indicate the quality of the light, as shown by the time taken for the test paper in a Wynne exposure-meter to darken to the standard tint, and the time the print is exposed. An alternative method is to employ a print-meter, noting the printing value of the negative; but this must be used with caution, for the relative sensitiveness of a bichromated film to strong and weak lights is not the same as in the case of P.O.P. For this reason, it is desirable to print always in the same quality of light, or as nearly so as is possible.

Nothing has been said of multi-color gum work, for the simple reason that it should not be attempted by anyone who has not studied thoroughly the broad question of color. The writer has seen many multi-color gums, and has almost invariably found them offensive in the extreme. Of course, a man with the training of a painter and with a fine color-sense might produce wonderfully beautiful results, but such a man would probably paint instead of photographing; and the vast majority of photographers who essay multi-color gum work produce results which, to say the least, are not pleasing. There is, however, a modification of straight gum-work which might be classed as "harmony of dominant

tone," which is very valuable and results from using the same pigments for all coatings, but varying the proportions, thus:

First Printing:

Gum.....	$\frac{1}{2}$ ounce
Sensitizer.....	$\frac{1}{2}$ ounce
Ivory black.....	1 inch
Indian red.....	3 inches

Second Printing:

Gum and sensitizer.....	As above
Ivory black.....	2 inches
Indian red.....	2 inches

Third printing:

Gum and sensitizer.....	As above
Ivory black.....	3 inches
Indian red.....	1 inch

Fourth printing:

Gum and sensitizer.....	As above
Ivory black.....	1 inch

This is merely a suggestion for proportions, and each worker may vary them to suit himself, but the results may be very beautiful and harmonious.

It has been stated that the gum process tends to give greater contrast than other printing methods; but this, of course, is true only when the full amount of pigment is used in the coating mixture, for if only a slight amount be employed the full range of tones of the negative may be rendered, while the deepest shadows still remain high in value.

The writer hopes that enough has been said to persuade more workers to take up this most beautiful and valuable printing process, for it really does not deserve the evil reputation which has been accorded it. It is undeniably, by reason of its flexibility, a difficult process to master; nor will the worker who takes it up with the idea of turning out prints by the dozen ever attain the full beauty of the medium,

though the writer knows of at least one professional who uses gum for a considerable proportion of his portrait orders. But for the photographer who aims at producing one perfect print rather than a score of mediocre ones, gum, multiple gum particularly, is the printing medium *par excellence*, possessing, as it does, all the good qualities of any other medium, and some which no other can claim.

## APPENDIX D

### GUM-BROMIDE PRINTING

WILLIAM S. DAVIS



INCE the majority of our readers probably know the theory of the gum-pigment process an extended description of it is not necessary, but it may, nevertheless, be well before going further to explain the principle involved, for the benefit of any who may not happen to be familiar with the subject. Briefly, the method is based upon the fact that a coating of pigment when mixed with a colloid, like gum arabic, and then rendered sensitive to light by the addition of a bichromate compound, becomes insoluble when exposed to daylight a suitable length of time. The result of exposing a sheet of paper so prepared under a negative is to render the pigment more or less insoluble in proportion to the strength of the light-action through the various parts of the negative image. Since the light-action simply fixes the pigment already upon the paper, development, so called, consists of rendering the picture visible in its degrees of light and shade by removal of the superfluous soluble pigment in the halftones and lights, which is accomplished by soaking in water. While the theory is very simple, and a perfect print very beautiful in richness of texture, there are difficulties in practical manipulation which render the results rather uncertain, especially when the composition contains a long scale of tones. This is due to the fact that the coating must be as dark as the strongest tone to show the full range of gra-

dation, and, when the coating is made rich in pigment, the light-action during a normal exposure only fixes the lighter tones upon the surface, leaving a soluble layer of the coating next the paper, the natural result being to cause such portions of the image to dissolve during development of the image in water, spoiling the tonal values of the picture.

The most practical method of overcoming the difficulties just cited lies in multiple printing, which, as commonly practiced, consists in the repeated application and exposure of thin coatings of gum and pigment until the shadows are of sufficient depth, some workers employing half a dozen coatings to attain their object. However, when a number of coatings and printings are resorted to there is always the chance of spoiling the result by an error in registering the image at some stage of the work, aside from being a tedious method to follow. As a means of simplifying this method without sacrificing the peculiar quality of the gum image, which recommends itself to pictorial workers, one can use bromide, or "gaslight" paper for the first printing to produce a foundation image which will strengthen the halftones and shadows — then apply a gum-pigment coating containing a limited quantity of color over this, and by a single additional exposure obtain a pigment image of quality as good as or better than is produced by a much larger number of gum-coatings alone. As the foundation image can be secured by exposure to artificial light in the darkroom, daylight is only required for the exposure of the single gum coating — a feature which is often of considerable value to a busy person who can only find time for a limited amount of work during daylight hours. By making one's selection from the many varieties of sensitized paper available, almost any kind of paper texture may be obtained.

With this outline of the object and advantages of a gum-

bromide combination we will consider the details of manipulation.

**THE FOUNDATION-PRINT AND ITS RELATION TO THE FINISHED RESULT.**—Since the character of the finished picture is greatly affected by the strength, contrast, and surface texture of the foundation print, one should have a good idea of the ultimate effect desired before commencing work.

One of the first things to consider is the printing quality of the negative. Owing to the wide range of contrast given by different grades of papers, it is possible to utilize for this process negatives which would not be really suitable for the pure gum process, though it is better to have negatives of medium contrast and density, those which give good prints upon regular bromide, or soft grades of D. O. P., being a good standard to aim for.

For small prints in which one wishes to retain considerable detail a paper of smooth texture should be employed, the matte or so-called "plat." surface, such as P. M. C. Bromide No. 2, or, if a slower printing paper is preferred, Cyko No. 5. For general work, however, papers possessing a medium rough grain, such as P. M. C. No. 3, Wellington Rough, in light or heavy weight, etc., are most suitable. I have occasionally made use of the Barnet "Tiger Tongue" grade, which is probably the roughest surface bromide on the market, approximating in texture rough Whatman water-color paper, but such a surface is only adapted to very broad effects, or for prints of unusually large size.

Papers of extremely rough, or very smooth, texture are not as easy to coat with the gum-pigment mixture as those of medium texture.

Generally, it is advisable to secure a rather sharp scale of contrast in the foundation image, although the strongest

shadows should not be of the full depth desired in the finished work, since allowance must be made for the pigment tint superimposed upon the silver image. The proper depth varies in inverse ratio to the amount of pigment used in the gum coating, but ordinarily the deepest shadow in a subject showing a full scale of tones should be represented by a medium dark shade of grey, while the lightest parts can be nearly blank paper in the foundation print, as even a coating weak in pigment will produce a marked effect in building up all the lighter tones.

If the intention is to use a gum coating containing but a very small amount of color — just enough in fact to produce a glaze of tinted gum — it is, of course, necessary to make the foundation image almost the full depth of the finished picture, and with complete gradation in every part. On the other hand, a rather strong pigment coating, especially when decidedly different in color from the grey foundation, only requires a silver image strong enough in the shadows to give more depth to the darker tones, the pigment supplying most of the gradation in both lights and middle tones. This brings up another matter — that of using pigment coatings of different colors. For all the more delicate variations from a straight black tone, such as blue-black, warm black, and grey-green, the natural grey image of the bromide print makes the best foundation, even when the gum-pigment coating is decidedly transparent. In fact the over-glaze in a different color is very distinctive in its quality, and frequently most pleasing. To obtain such a result I have sometimes used a gum mixture containing very little color, and exposed the coated print to light long enough to set the pigment, without making use of a negative for the gum printing, but this can only be done where there are no important highlights to consider.

If a pronounced color is wanted, it is advisable to tone the foundation image before applying the pigment. For a warm brown effect the sulphide sepia toner is suitable, or in case a still warmer color is desired in the finished picture, such as a red chalk effect, the copper toner will bring the silver image into harmony with the pigment coating. Bright green can be produced by first toning the bromide print blue and then using a yellow-green pigment coating, which will produce a warm sunny effect in the lighter tones, with cool blue-green shadows (where the color of the silver image is stronger) — a result suggestive of what is seen in a summer landscape on a bright day. By such means it is possible to produce as pronounced a color effect as may be desired, though as a rule I think it is in better taste in a monochrome print to keep to soft tints when the black and white image is changed.

The matter of correct registration of the negative during the second printing must be considered to start with, and the simplest way of insuring this is to discard the usual printing-frame and use instead a printing-board. This need only be a perfectly flat board an inch or more larger all around than the negative, but to prevent warping by exposure to the sun it is well to have it battened. When in use the board is covered with a layer or two of blotting paper or felt, to secure good contact between paper and negatives. For reasons which will appear later it is helpful to border the edges of the negative with gummed paper or liquid opaque, as is done for carbon printing. The bromide paper should be a little larger than the negative, say 7 x 9 for use with  $6\frac{1}{2} \times 8\frac{1}{2}$  negatives, both for the purpose of securing registration and for convenience in applying and developing the gum coating.

To make the print. First ascertain by the use of trial

slips the exposure required to secure the kind of an image wanted, then lay a sheet of paper, film side up, on the covered side of the printing-board, and over this the negative, face down, leaving a margin of paper showing all around the edges. Fasten in position with thumb-tacks or push-pins, or, if preferred, a piece of clear glass the size of the board can be placed on top of the negative and held by spring clips on all sides. After exposure and development, the print will show black edges, with a white line where the opaque border on the negative protected the paper from exposure. This line will be sufficiently clear, even after the pigment coating is applied, to render correct placement of the negative easy for the second printing.

When the print is washed and dried it is ready for coating with pigment, but can be kept any length of time until convenient to do so. Care should be taken to keep the surface free from any trace of greasiness which might occur through careless handling. If the prints are kept under pressure until well flattened before applying the gum coating, the latter operation can be accomplished more conveniently.

**THE PIGMENT COATING AND ITS APPLICATION.**—The materials needed for this portion of the work include ammonium bichromate for a sensitizer, gum arabic (the lump form is most likely to be pure), moist water-colors in tubes, those sold by artists' colormen as "Students'" colors answering the purpose as well as more expensive forms, a stiff flat bristle brush for applying the coating,  $\frac{3}{4}$  inch wide being a good size, and last, but not least, a good blender for equalizing the coating after it is spread. A badger-hair blender is the most suitable and effective, and can be had in two shapes—a flat knotted hair made for the use of grainers, which comes in different widths at so much per inch, and a round form, usually set in quill, which is the kind commonly

used by artists. Large makers of painter's supplies, such as Devoe and Raynolds, can furnish either style, the round shape being rather lower in price. Either style is suitable when large enough to enable one to go over the surface of the paper quickly, a two inch flat or No. 6 round being suitable for prints of the sizes most favored by the average worker.

To prepare the coating mixture, make up a 10 per cent solution of the ammonium bichromate, which will keep indefinitely in an amber colored bottle. If more convenient to obtain, potassium bichromate can be substituted by rendering the solution alkaline by the addition of a few drops of strong aqua ammonia. Next dissolve the gum arabic — one part in two of warm water — the process being hastened by first crushing the gum to a coarse powder. It is not advisable to prepare more of this than can be used in a few days, as it should not be used after becoming sour, and to prevent this by the addition of a chemical preservative is liable to react unfavorably upon the result.

Sufficient mixture to coat several 8 x 10 prints will be obtained by taking 2 drams of the gum solution and working up in a mortar or small dish with the necessary quantity of moist water-color. Ivory black is satisfactory for a slightly warm black or grey tint, which can be made cooler in shade by adding a small amount of French blue or ultramarine. Should such a mixture show a greenish hue a *very little* crimson will overcome it. To make a warm black add a considerable quantity of Vandyke brown. The latter used alone gives a good brown, which can be rendered warmer by the addition of burnt sienna. Tints similar to those seen in a gold toned P. O. P. print can be produced by mixtures of crimson and Vandyke brown, or crimson and black. Raw sienna or Indian yellow with black, French ultramarine, or

Prussian blue, gives a varied series of greens, mixtures with black giving grey-green tints, while the brighter shades are produced by combining Indian yellow and Prussian blue. Having secured the tint desired, which is best determined by rubbing a little of the mixture on a piece of paper, add an equal quantity of the bichromate solution to the gum and color mixture, and filter through muslin or an old handkerchief. No rule can very well be given as to the exact quantity of pigment to use, since it depends so much upon the character of the foundation image and the particular effect wanted. The only way is to note the appearance of the darker parts of the image after the mixture is applied, taking care, however, to make allowance for the change in color and depth of tint produced by the addition of the bichromate to the mixture, for the strong yellow color of the latter does not remain in the finished print. It is a good idea to spread some of the coating upon a discarded print containing approximately the same strength of image as the print to be coated, and note the effect before going on with the work.

The proportion of bichromate and gum solution may have to be altered slightly according to the surface to be coated, or the effect desired, though the proportion named above is a good standard for general requirements. More bichromate solution may be required when working upon a smooth, hard surfaced paper, especially if one wishes to avoid any gloss in the finished print. On the other hand, rough papers do not usually contain as much gelatine in the emulsion, and this fact, together with the grain of the paper affording a better hold for the pigment coating, makes it possible, and sometimes advisable, to increase the proportion of gum solution in the mixture.

Coating can be done in subdued daylight or by ordinary artificial light, as the mixture is not very sensitive while wet.

Lay the dry print upon several layers of clean newspaper, or a blotter; and, holding one edge down with the finger tips, quickly cover the surface with the gum and pigment mixture, working the bristle brush vigorously in all directions. Use plenty of the mixture at first, brushing out until the surface appears free from bubbles—then *immediately* take up the badger-hair blender and, holding it in a vertical position, go over the entire surface as rapidly as possible with an up and down *stippling* motion until streaks in the coating disappear. The secret of securing an even coating depends a good deal upon the speed with which the coating and stippling is accomplished, as the latter must be finished before the gum begins to set. When this is done, the print should be laid aside to dry, either on clean blotters, or hung up in a room from which daylight is excluded. In a warm dry room, the coating should dry in an hour or two. If the atmosphere is damp, or one is in a hurry to print, drying can be hastened by warming the print carefully over a stove or lamp, but if more than a moderate degree of heat is thus used the gum may dry brittle and crack off during development, if not before.

To keep the brushes in good condition, they should be washed out at once after finishing the work, and the blender requires washing under the tap or in a dish of water after every print has been coated. This is easily done, since a badger-hair brush can be dried almost instantly after rinsing by whisking it smartly against a towel or the palm of one's hand.

Mix only enough of the gum and pigment for a day's use, and don't coat more paper than can be printed the next day, since the coating gradually becomes insoluble with age.

**PRINTING AND DEVELOPING THE GUM COATING.**—Arrange the paper and negative on the printing-board, correct register

being secured by placing the negative in alignment with the darkened margin of the print. Here is where the border between the image and blackened edges of the paper proves of assistance, since any displacement is indicated by a portion of the border showing as a light line outside the negative. Some try to secure proper register in an ordinary printing-frame by forcing the negative and paper into one corner, but aside from the chance of slipping, the result is not as satisfactory, especially with large prints, since repeated wetting and drying of the paper during manipulation causes a slight contraction, thus altering to that extent the size of the image, the effect of which upon absolute registration is best minimized by centering the negative upon the print rather than using one corner for a guide.

The exposure is best made in direct sunlight, the time depending not only upon the negative and strength of light, but also to some extent upon the kind of coating and its color. One rich in gum, or containing much red or brown pigment, requires a somewhat longer exposure than a thin coating, or one made up for a blue-black or green tint. While this may sound like a complicated set of factors, the whole matter comes down to the practical method of making a few trial exposures until one becomes accustomed to the results produced. To avoid unnecessary waste of large prints, it is a good plan to prepare one or two trial strips of paper for each subject while making the full sized prints — then expose and develop these (noting of course the length of time the gum-coating was exposed) before going on with the printing. Should one wish to make a number of prints from the same negative, or duplicate results at some future date, a print-meter, such as is used in carbon printing, will prove helpful if full data as to the coating mixture employed is also recorded.

A full exposure with a coating weak in color reduces

contrast, while a mixture containing more pigment, and given just sufficient exposure to hold the coating will show greater contrast with the same negative.

After exposure the print is soaked in several changes of water to remove the free bichromate — which is accomplished when the water ceases to show a yellow tinge. Then it should be allowed to float quietly face down for some time. As the coating on a correctly exposed print is very tender while wet, care should be taken at this stage not to let the face of the print come into contact with the edge of the tray, or allow running water to fall upon the surface. There is no necessity for protecting the print from daylight after it is wet, but development should be started soon after exposure, since the light action in the film of an exposed print continues as long as it remains undeveloped, no matter how carefully it is kept from the light.

The action of development is indicated by the dissolving of the pigment from the unexposed portions first, and if the exposure is just sufficient to hold the details in the lighter parts, the entire image may appear in half an hour or so, when the water is at normal room temperature, without doing more than occasionally rocking the tray gently to loosen the softened coating. An image brought out in this manner possesses the finest texture it is possible to produce by the process, together with a richness of surface, when a full amount of gum is used in the coating, which is difficult to describe. As the image will be extremely tender, and may even show a tendency to run a little in the lighter parts, making it necessary to handle the prints with extra care, the best thing is to remove from the water just as soon as the picture clears up, and lay the print, face up, on a dry blotter.

In the case of slight overexposure the coating becomes more firmly attached to the paper. Consequently, if the

image does not clear up after reasonably long soaking the print should be turned face up in the tray. Then, while keeping it well under water, an artist's flat camel's hair "wash brush," or a soft mop of loosely bunched absorbent cotton, is applied very gently with a stroking motion in different directions, to assist in the removal of the pigment. Highlights may be brought out by the application of a small round camel's hair brush, or even a pointed sable. Should the image fail to show readily under the treatment just mentioned, much overexposure is indicated, and the print had best be discarded, since hard scrubbing of the coating (while it will sometimes render the image visible) gives a coarse, sandpaper-like appearance, utterly lacking all the charm of surface texture which characterizes a first-class gum print.

If any indication of yellow bichromate stain remains when development is complete, it is readily removed by soaking the print for a few minutes in a weak solution of potassium metabisulphite, about 60 grains to a pint of water, afterwards rinsing in two or three changes of clear water. Sodium bisulphite, or a 5 per cent solution of common alum can likewise be used. If the coating of the print is very soft, however, it is safer to let it dry first — then immerse in one of the above mentioned baths to remove the stain.

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